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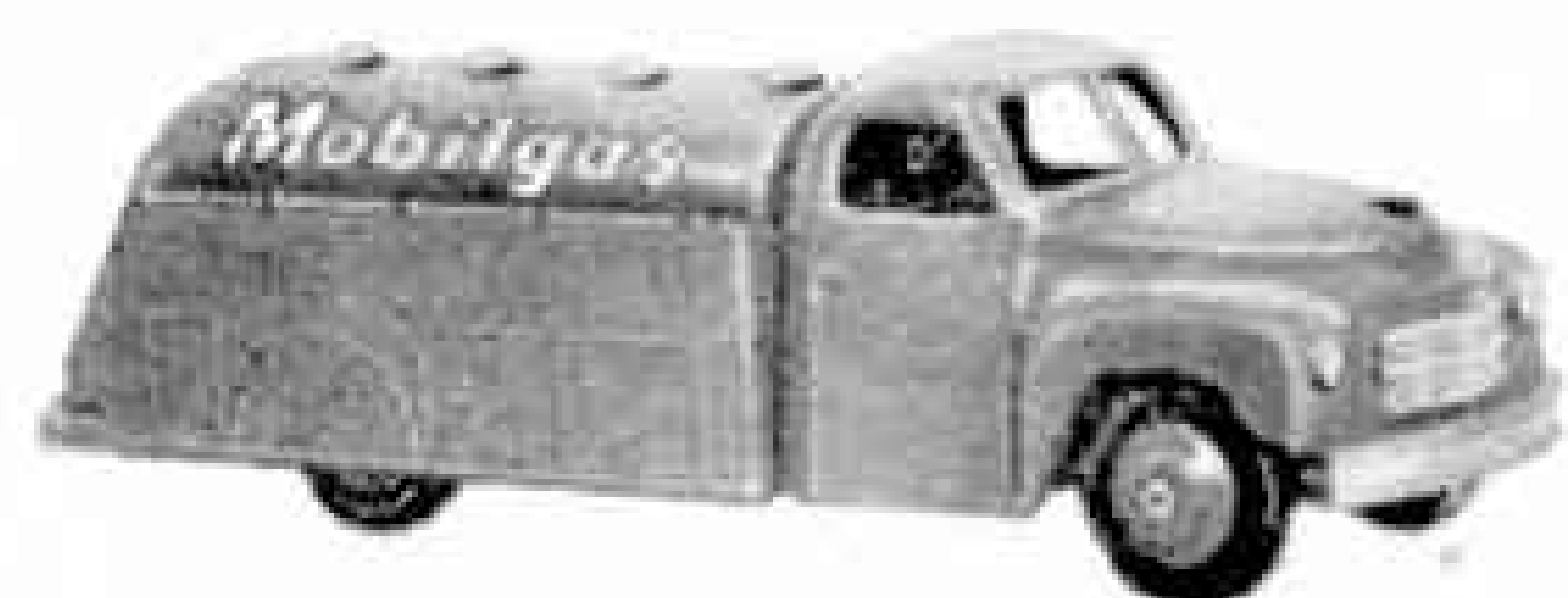
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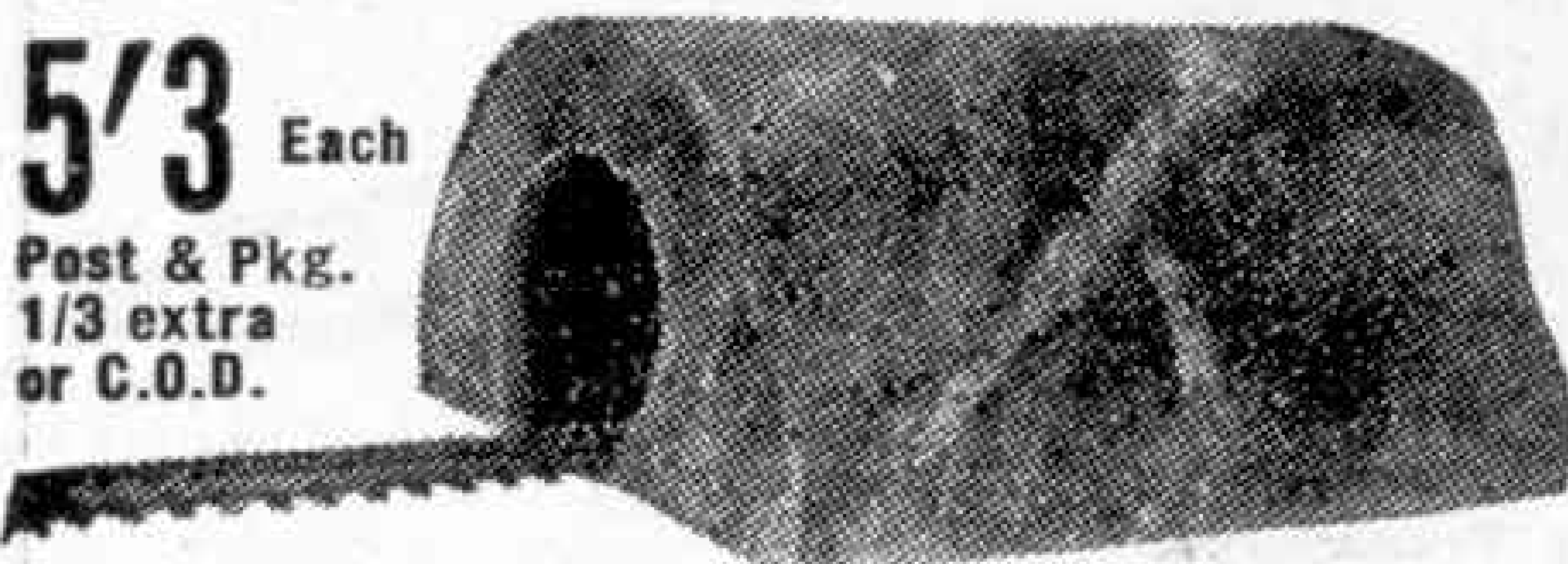
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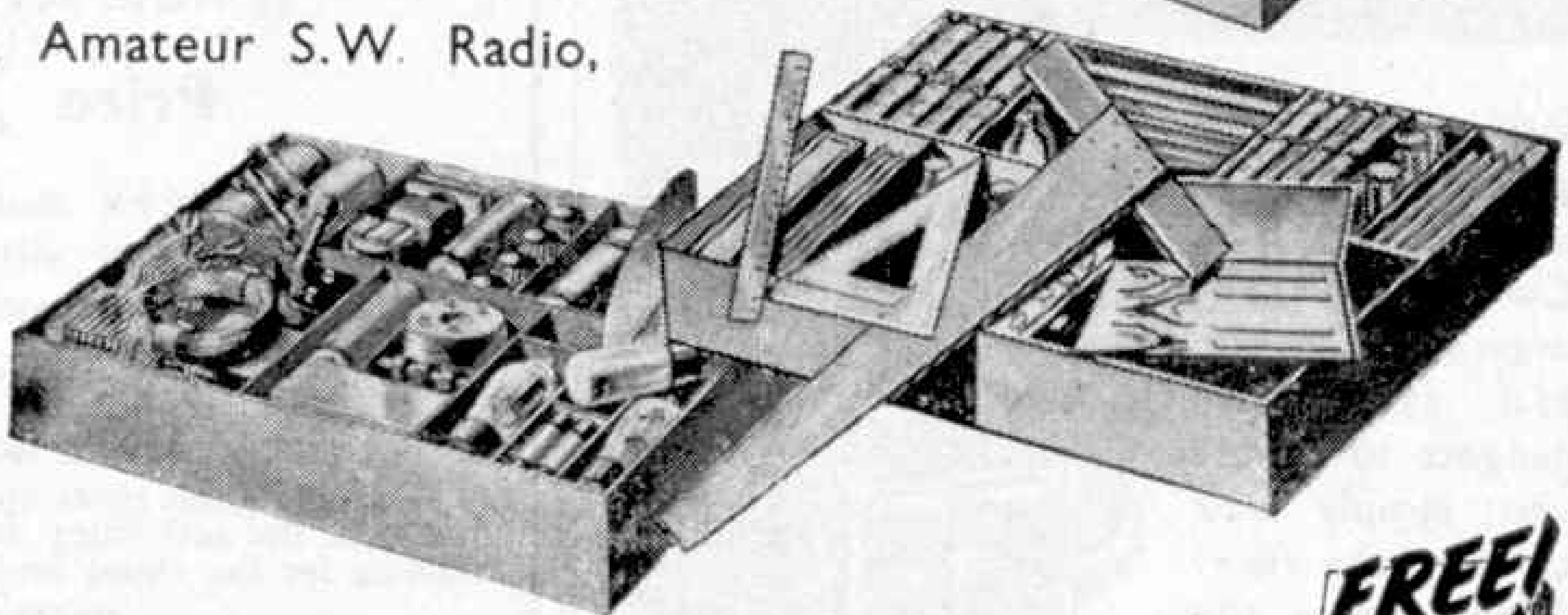
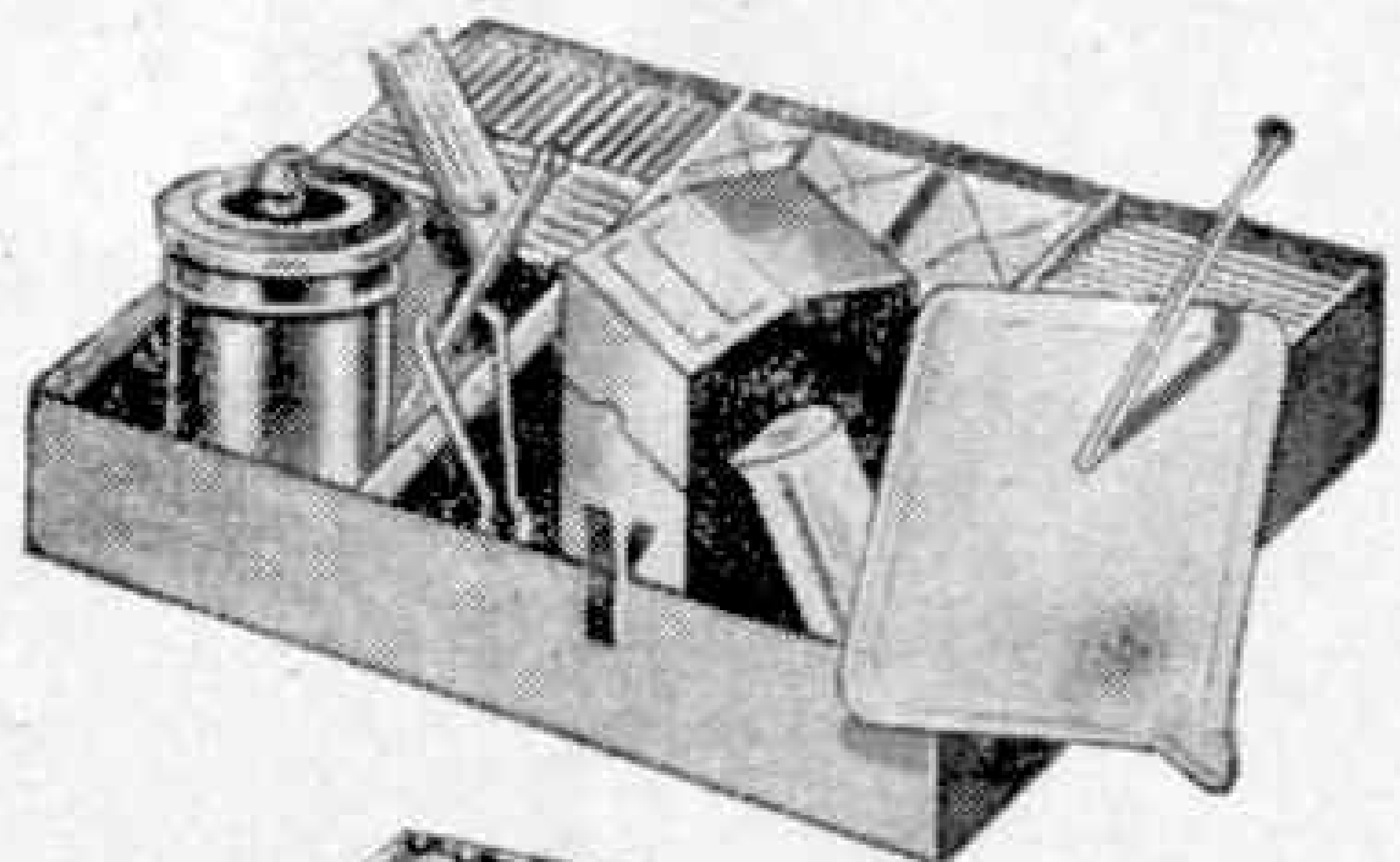
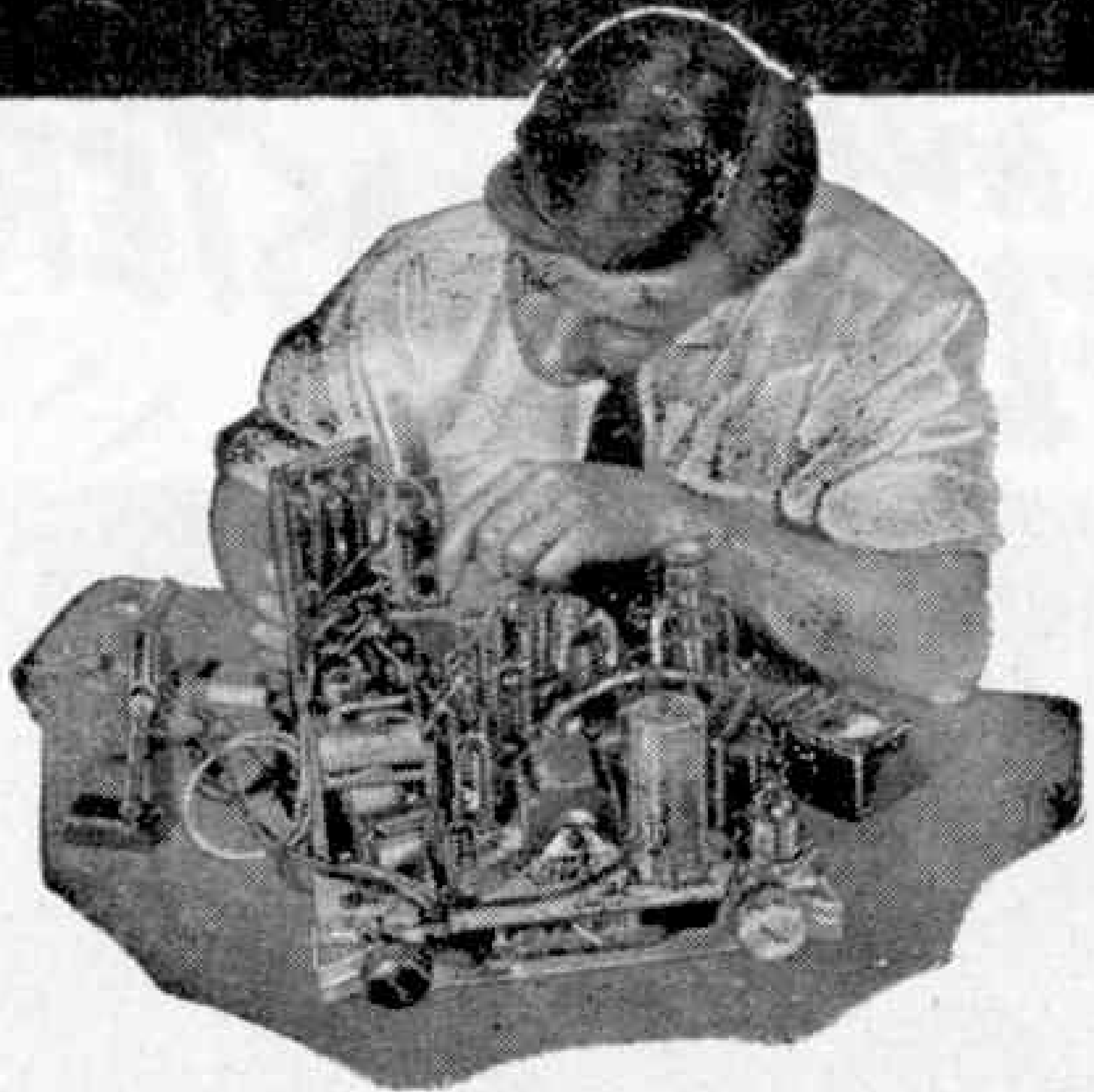
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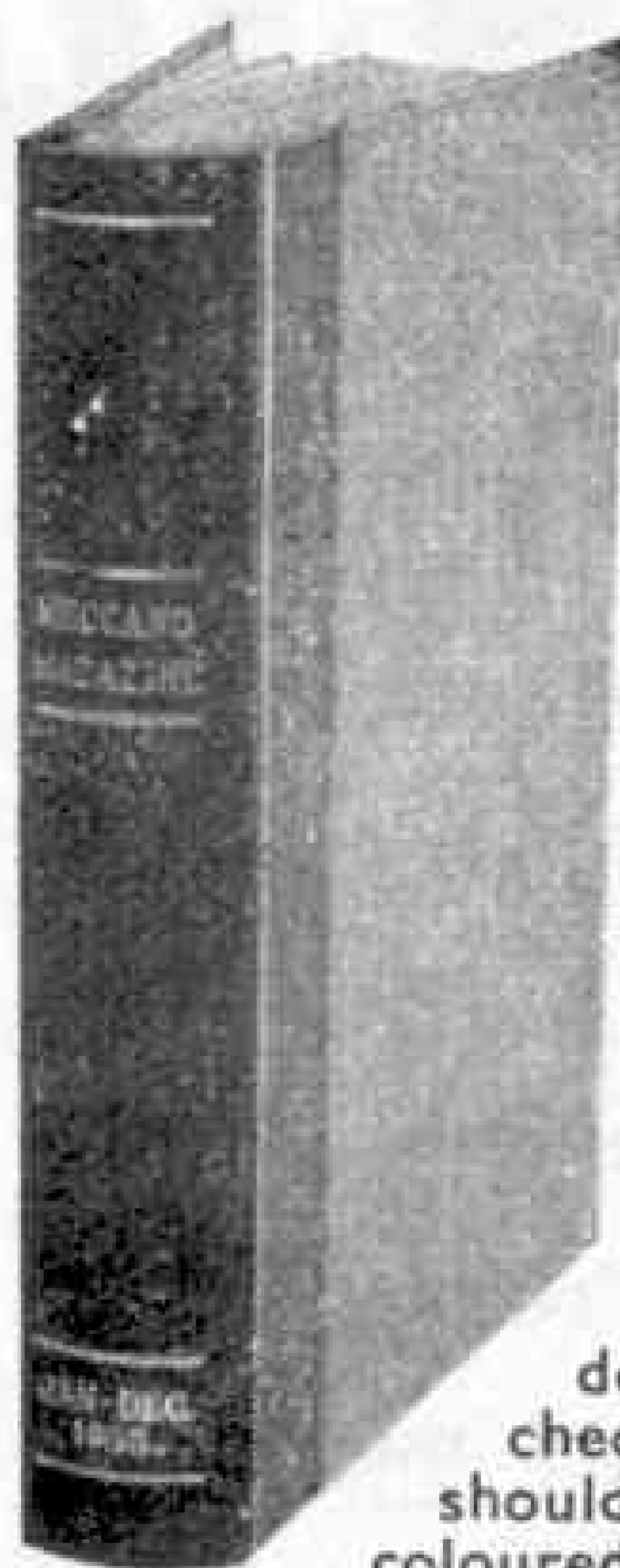
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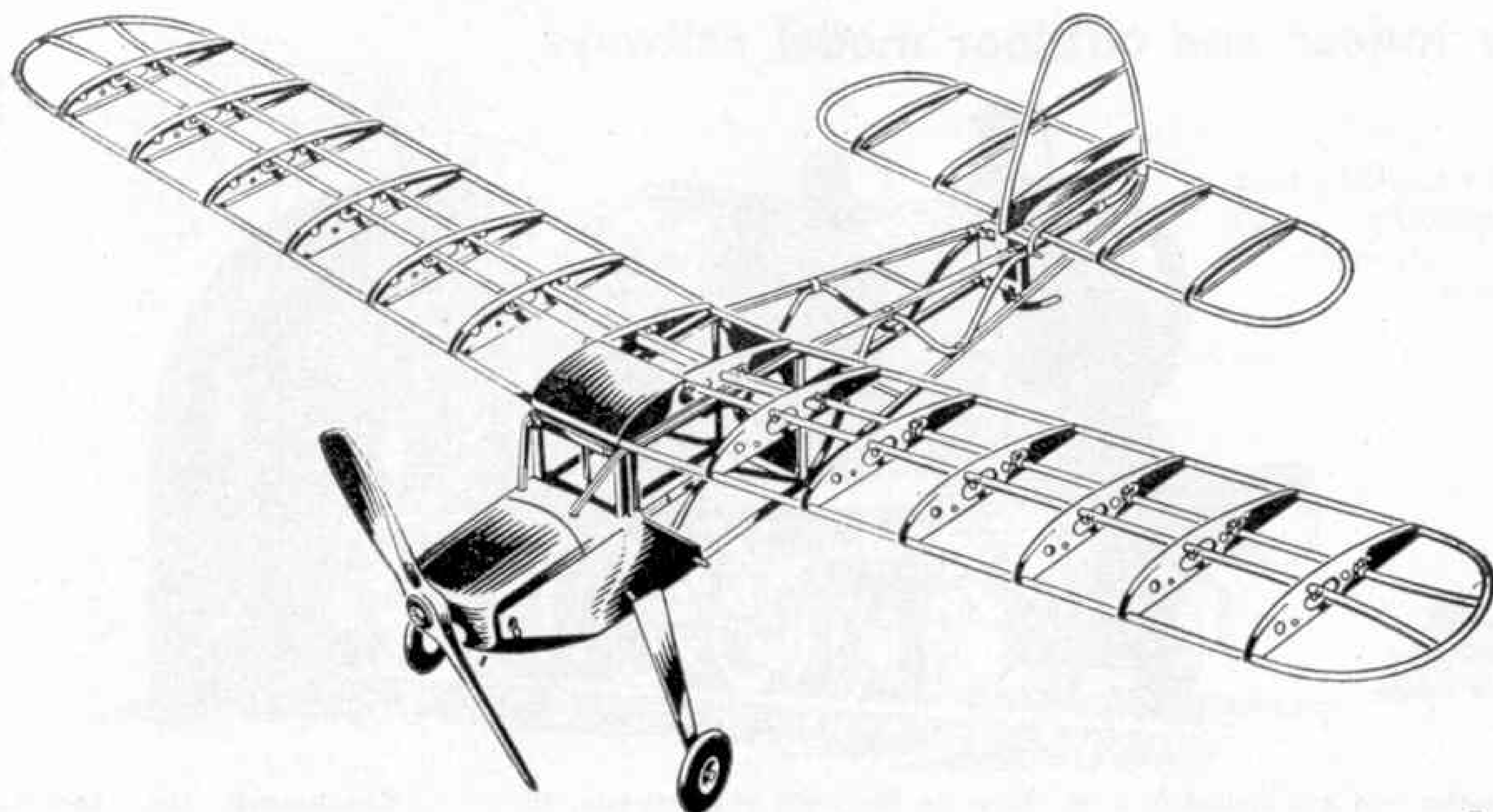
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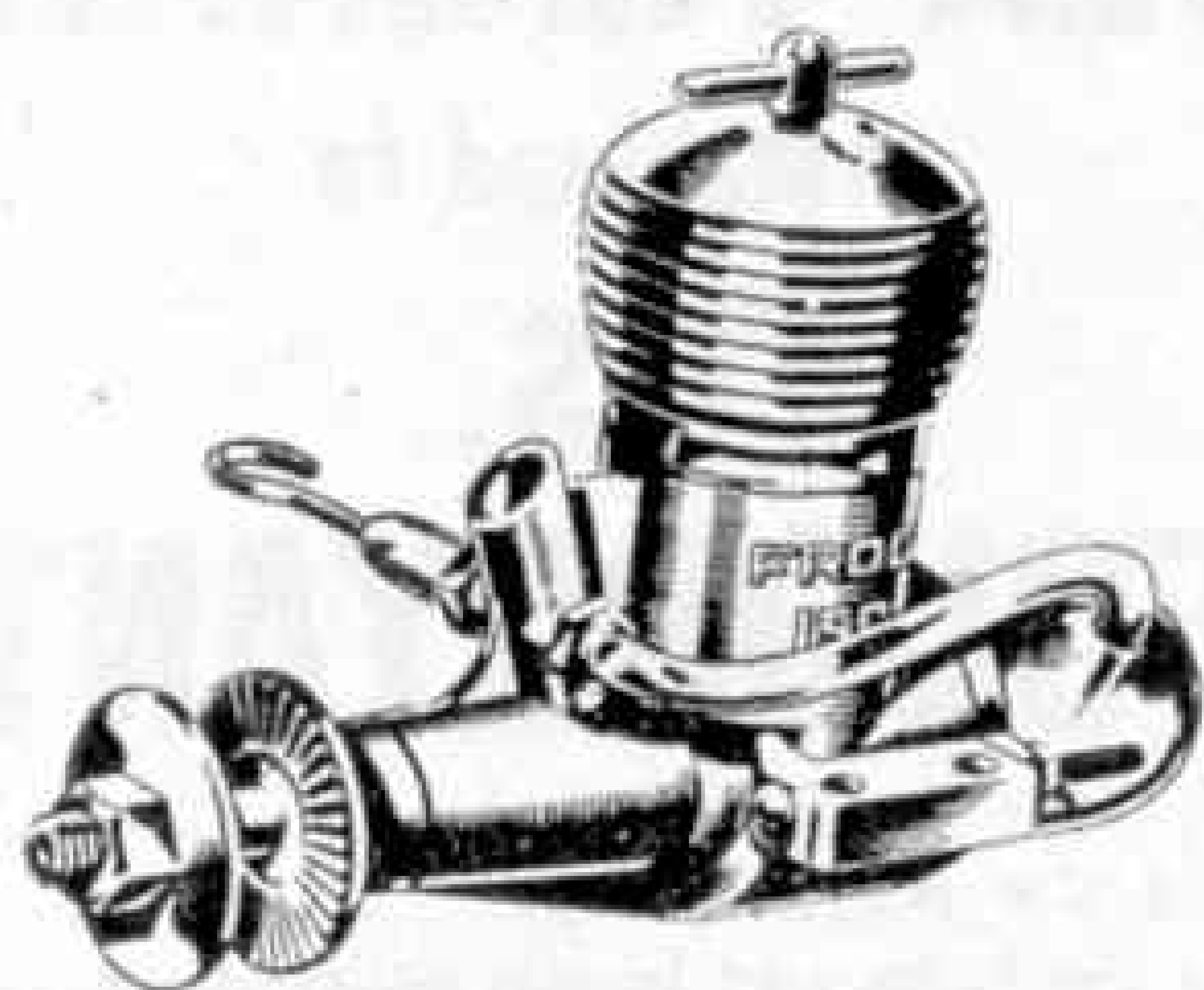
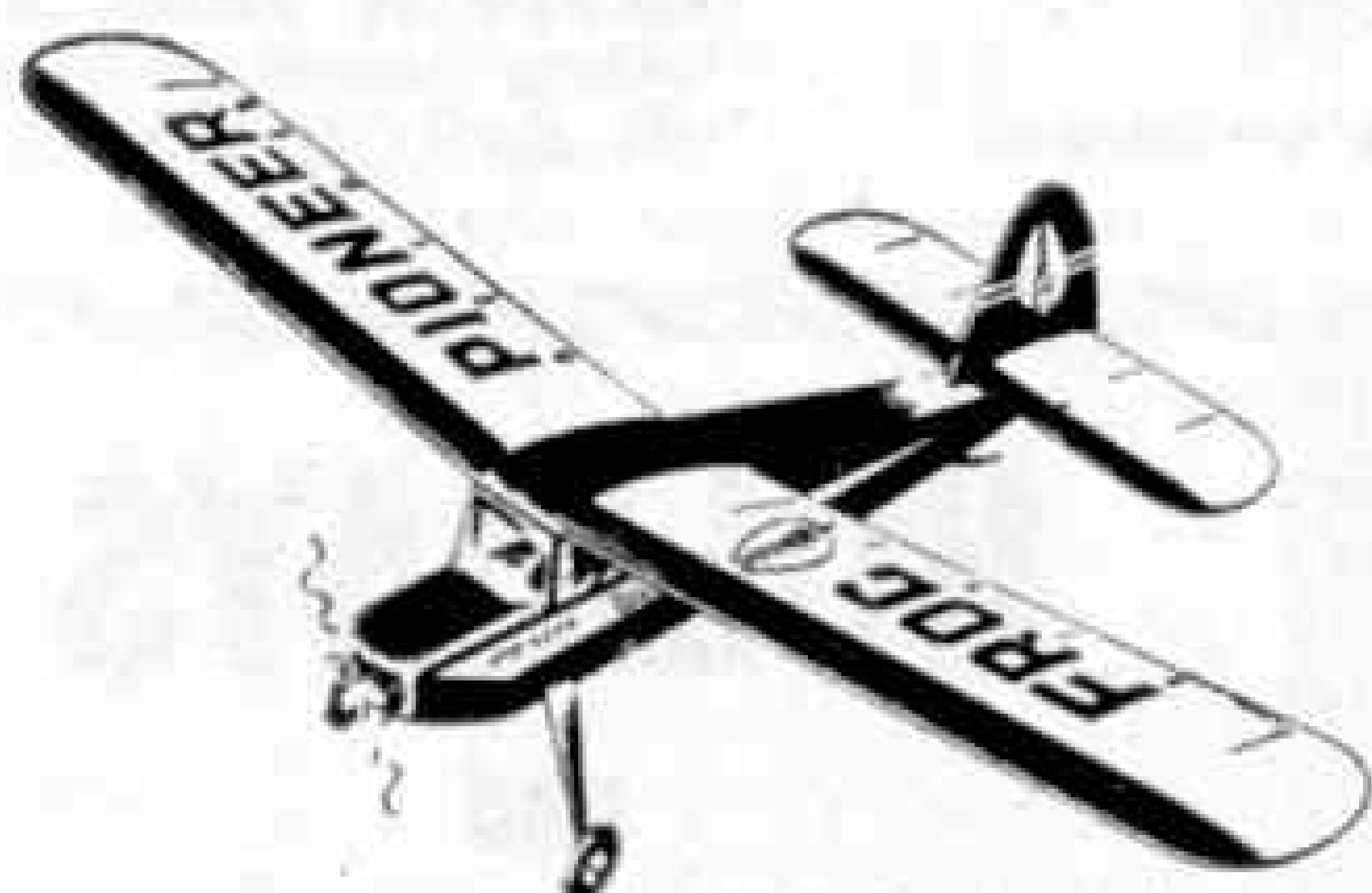
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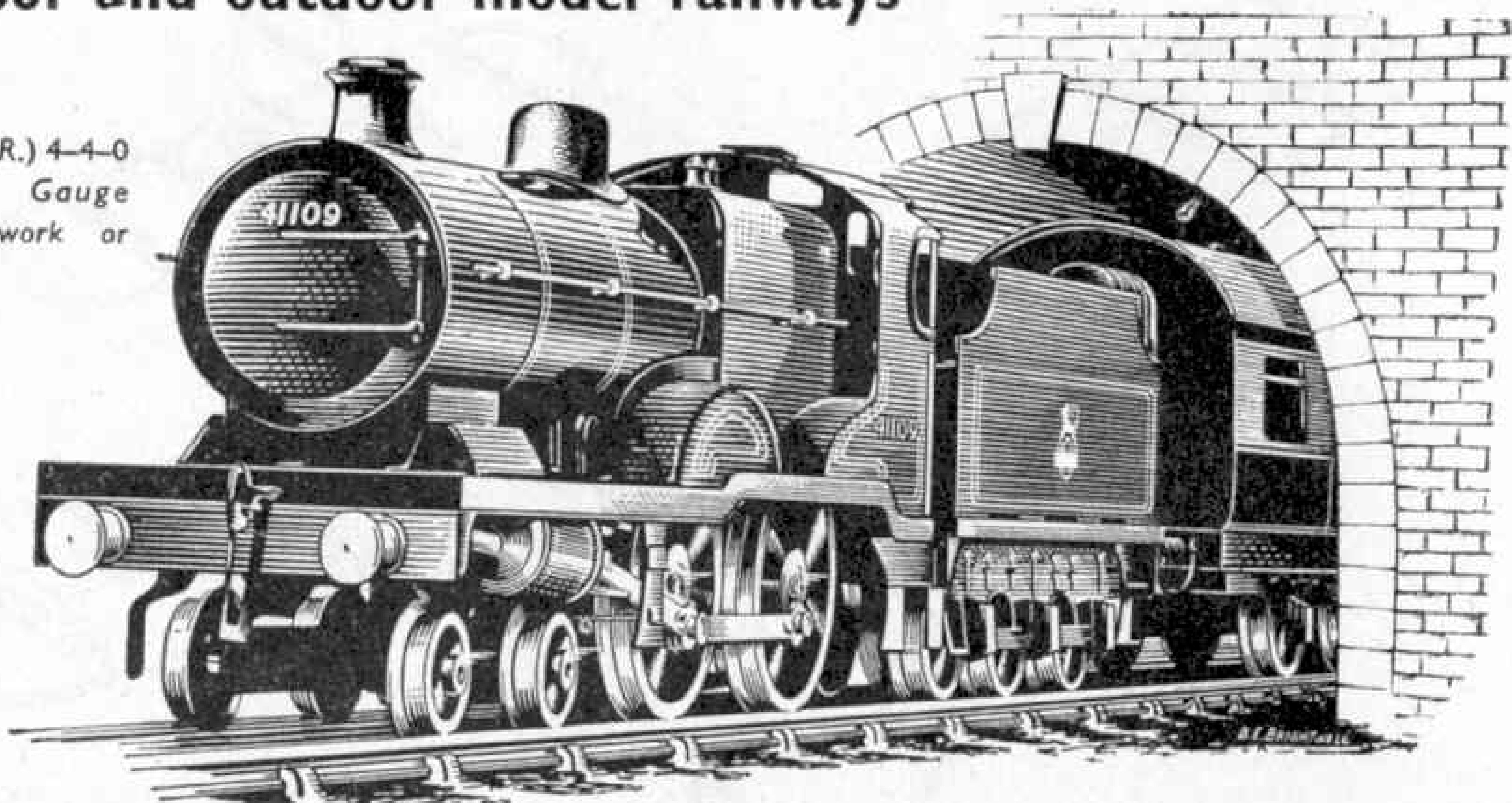
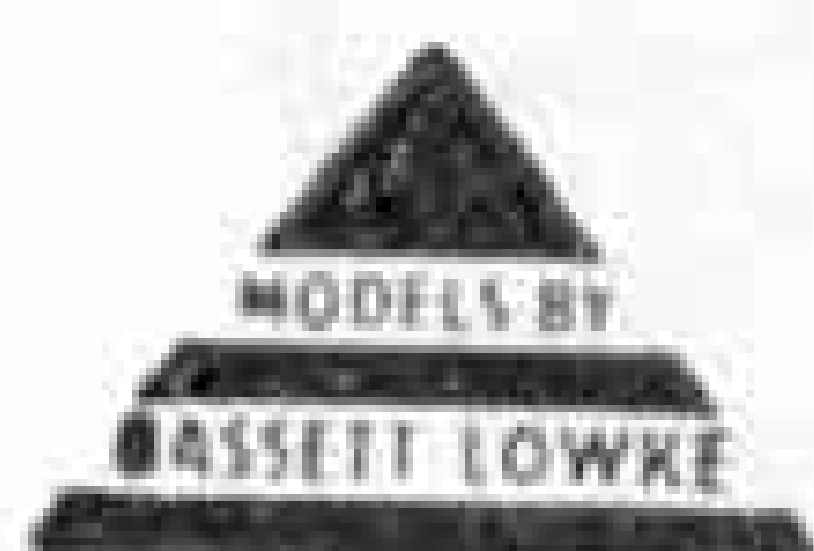
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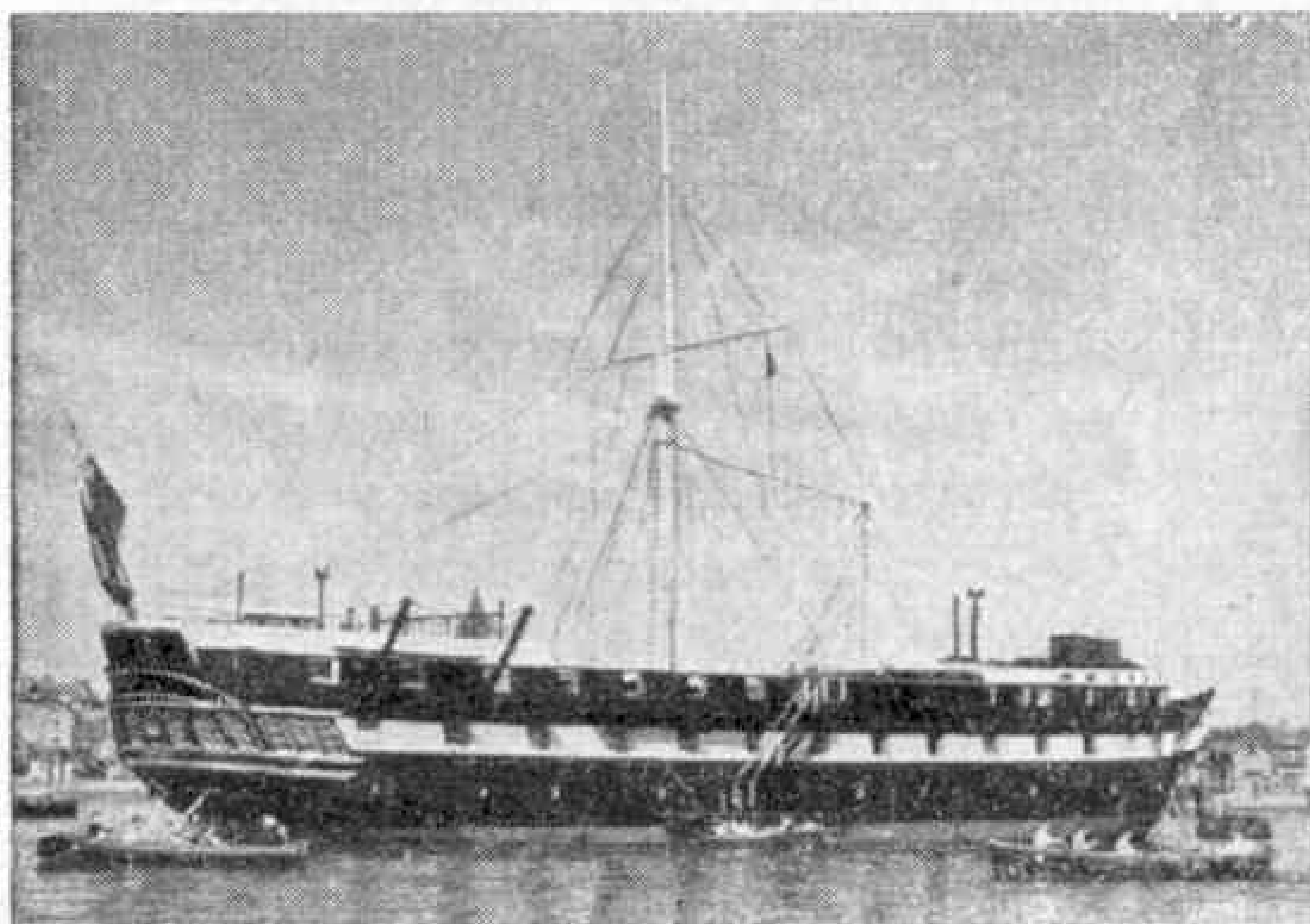
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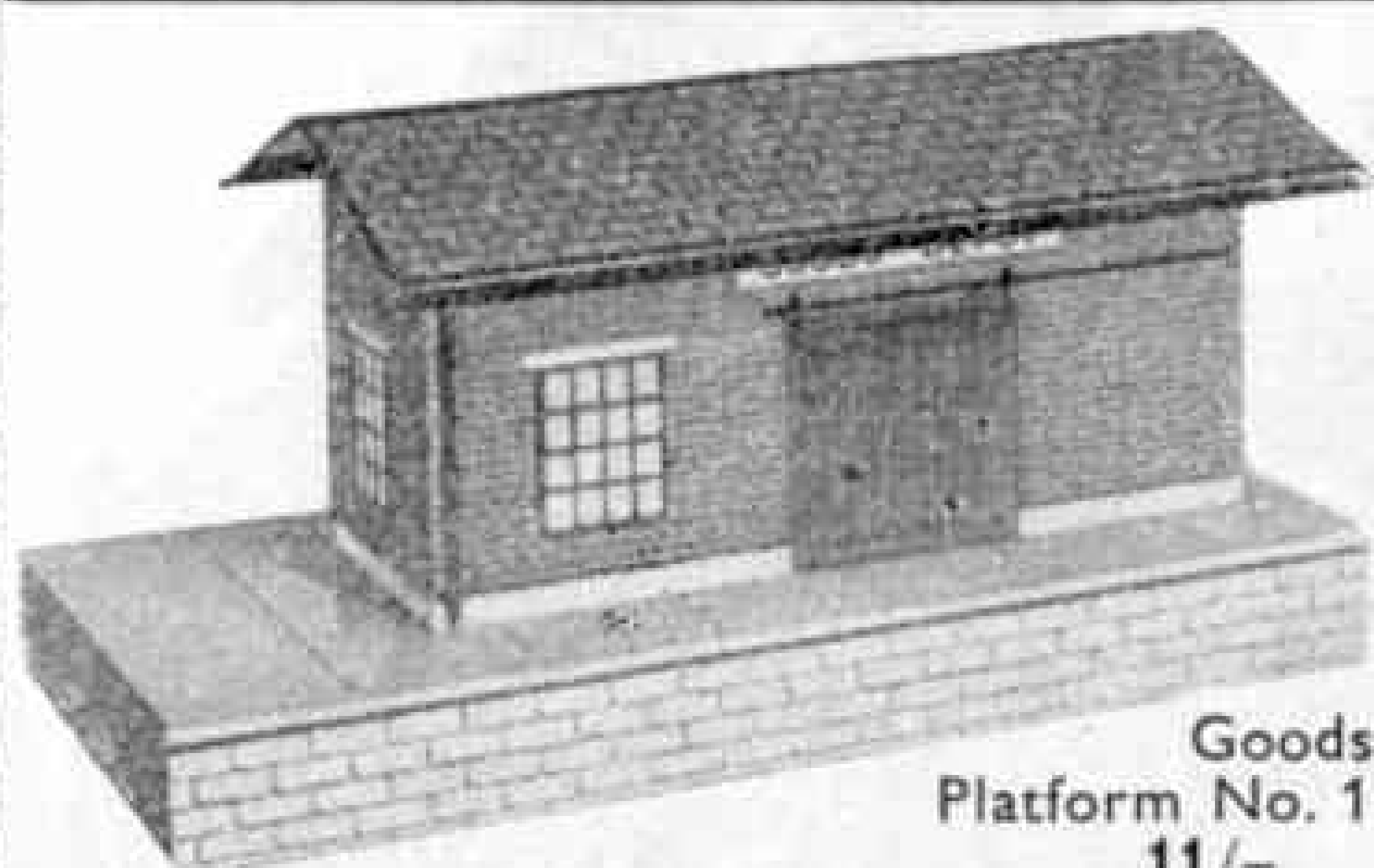


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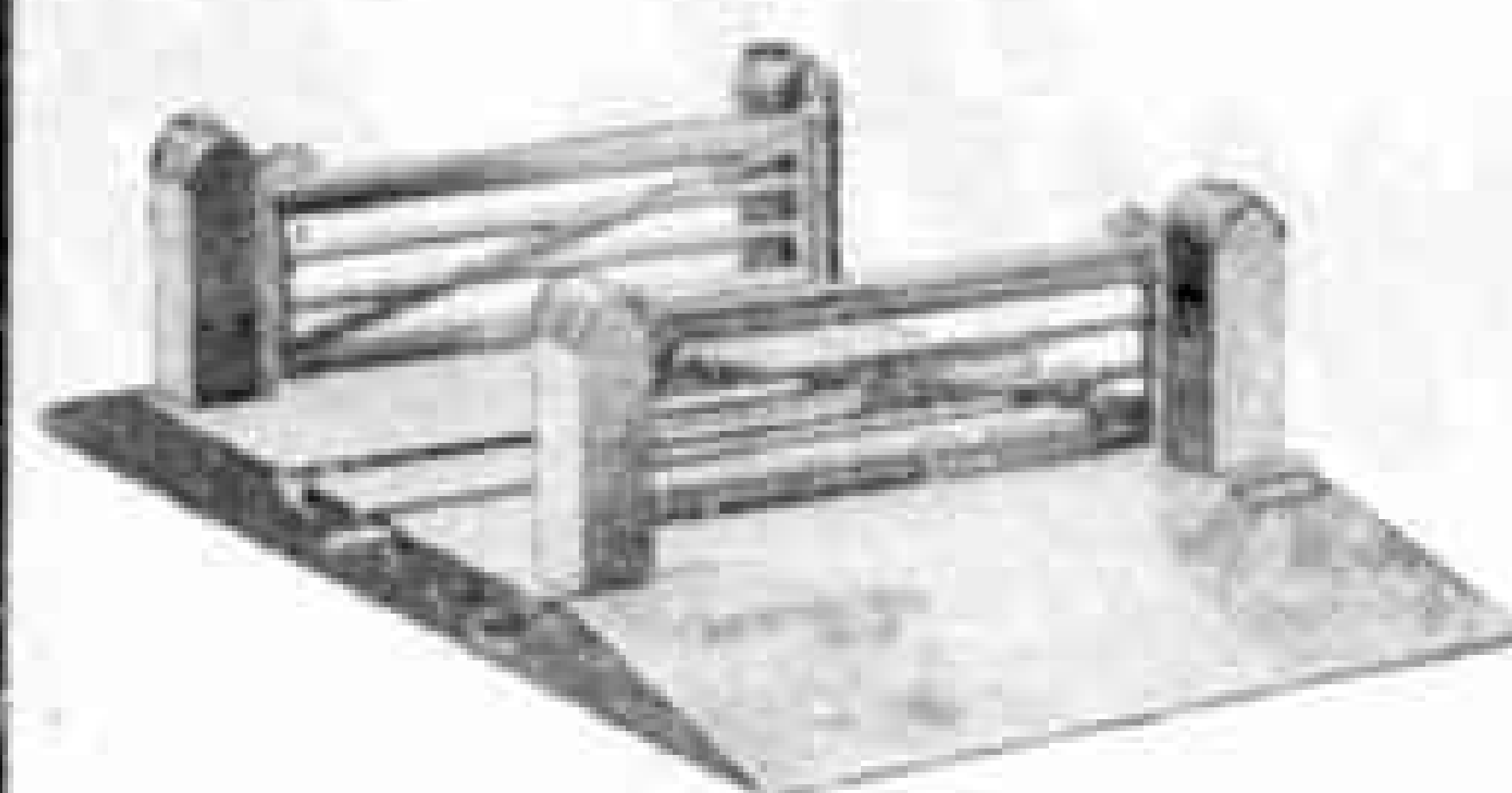
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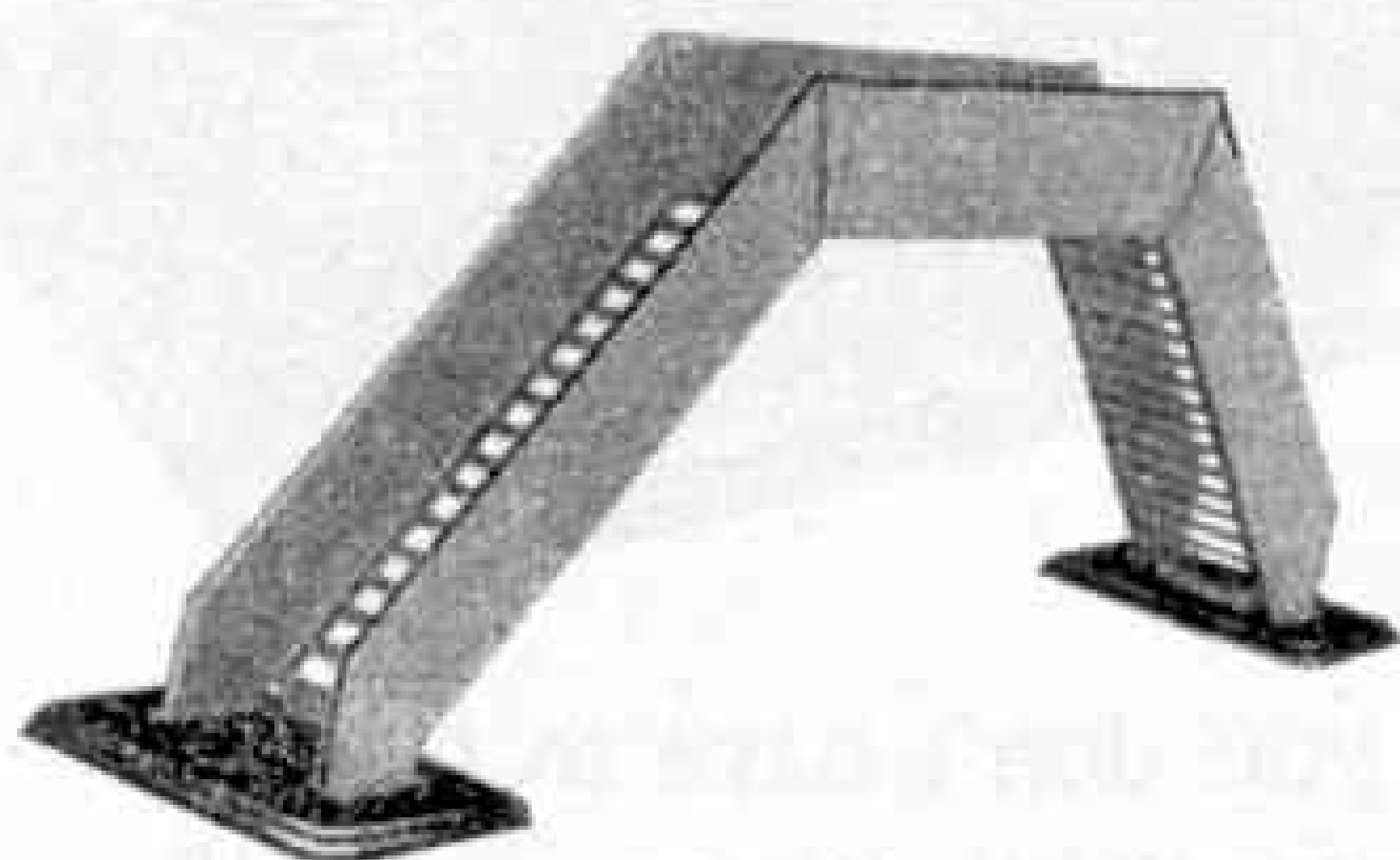
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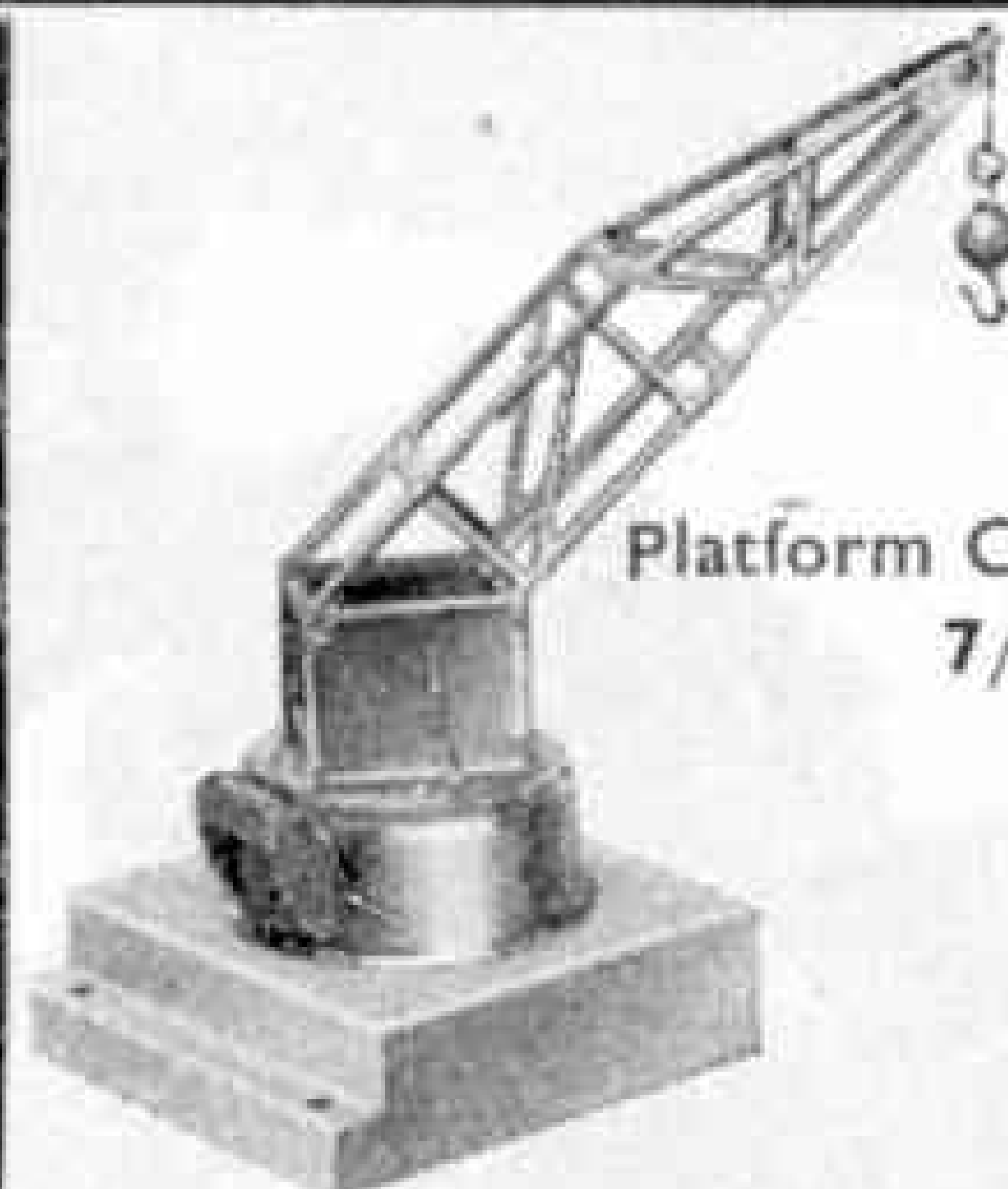
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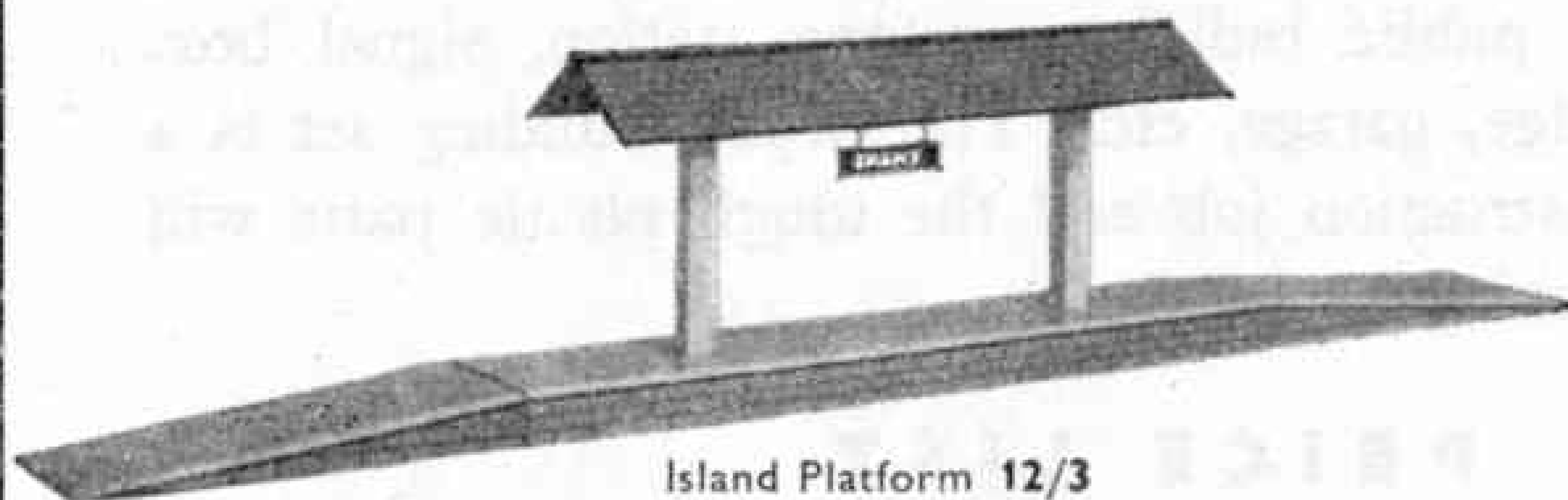
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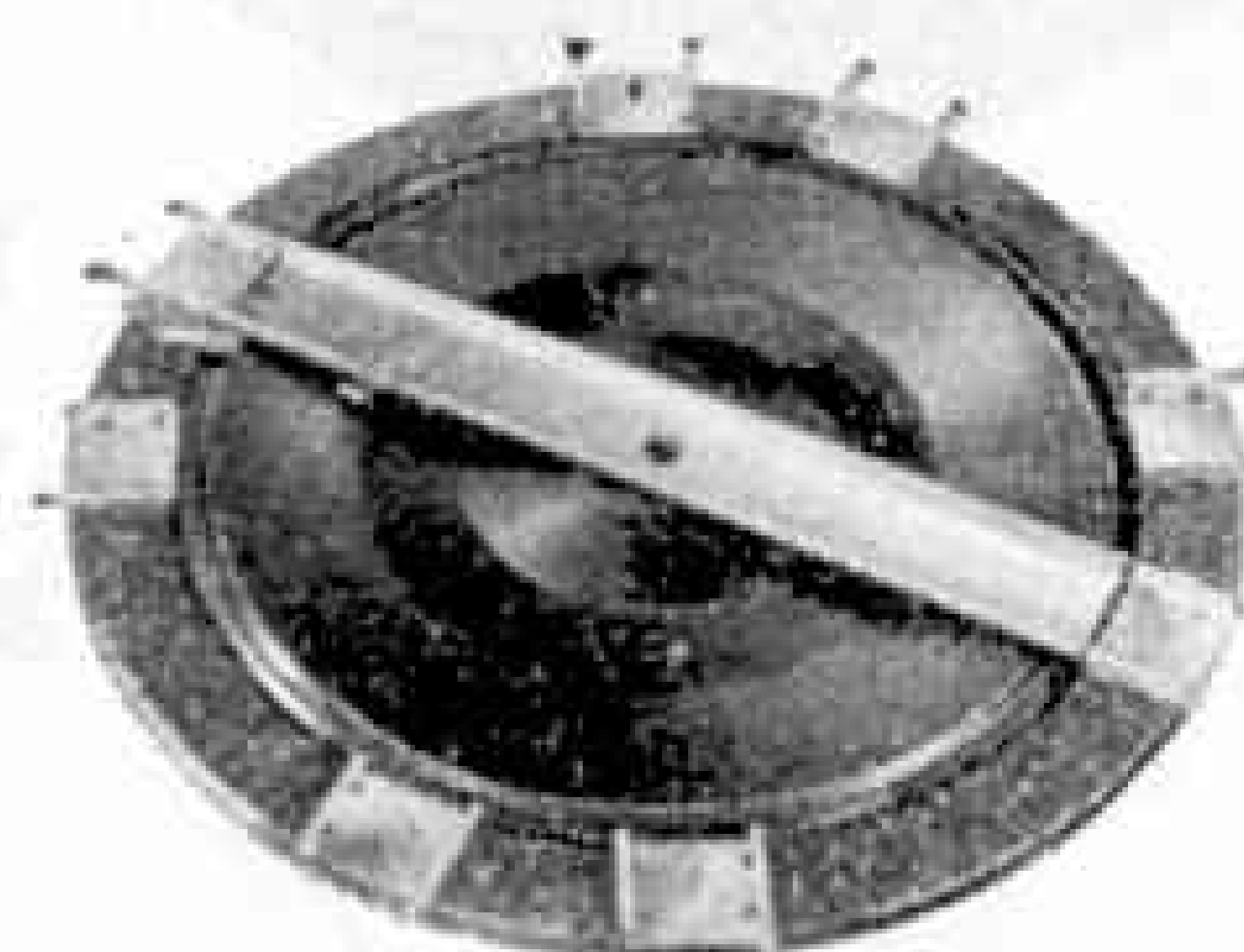
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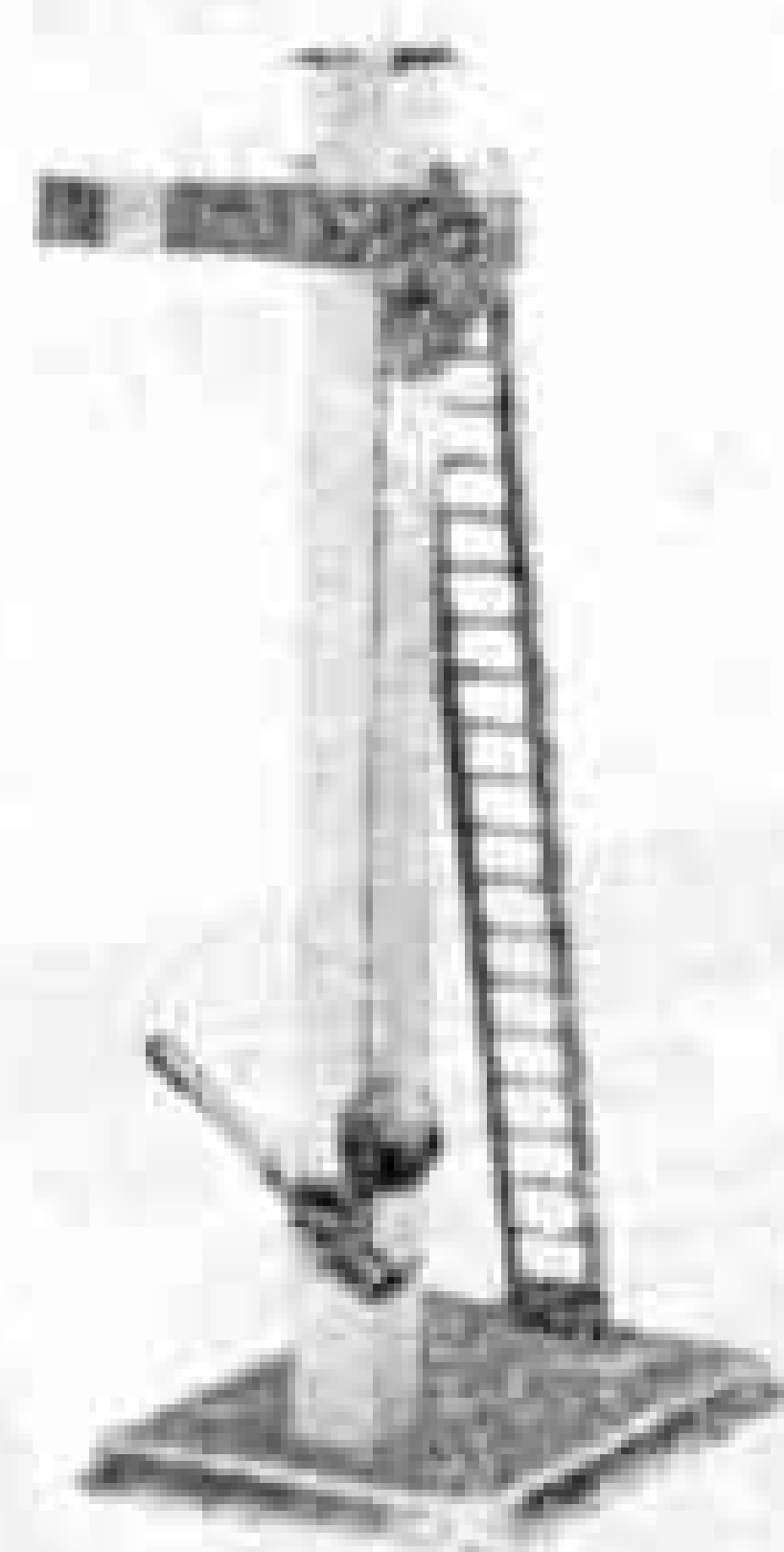
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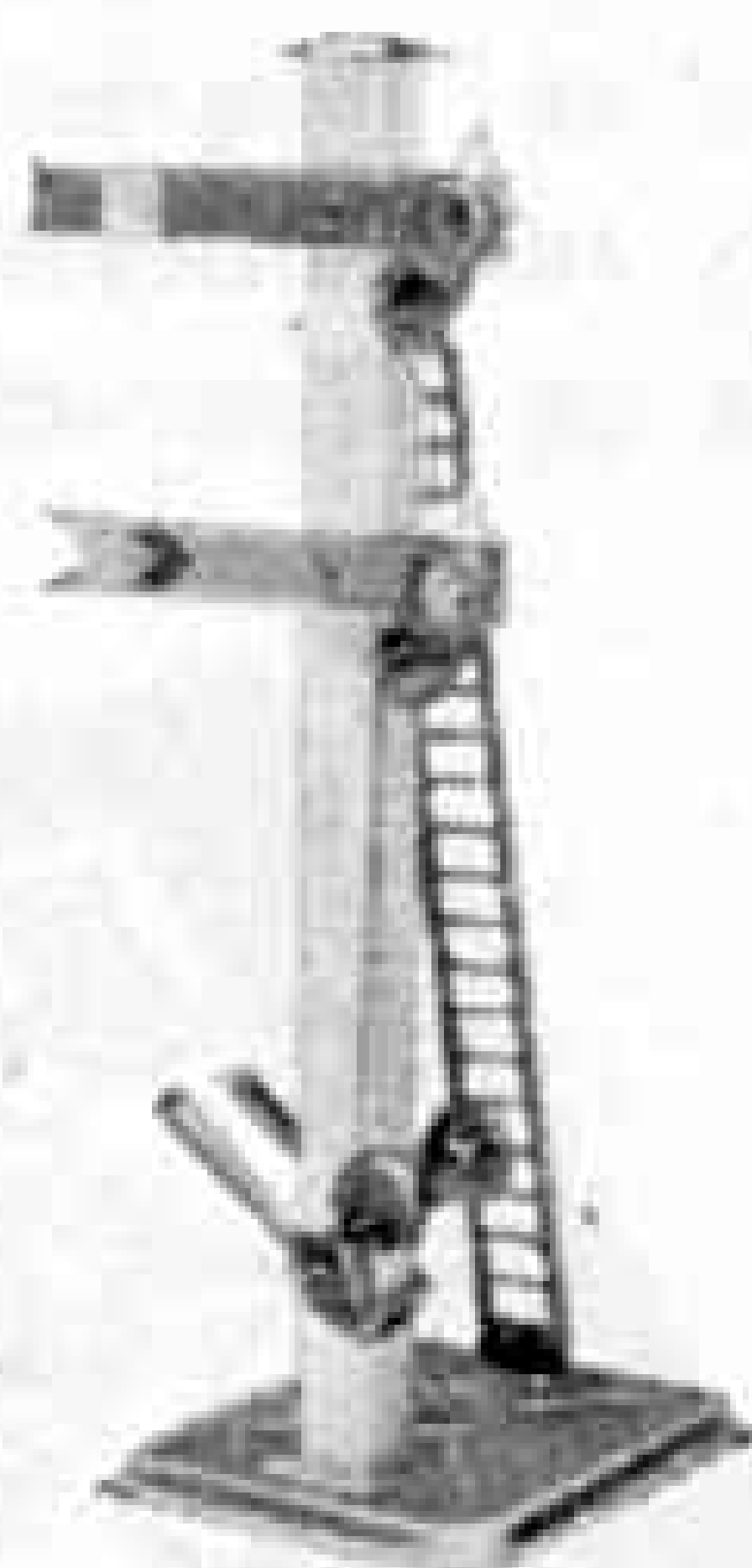
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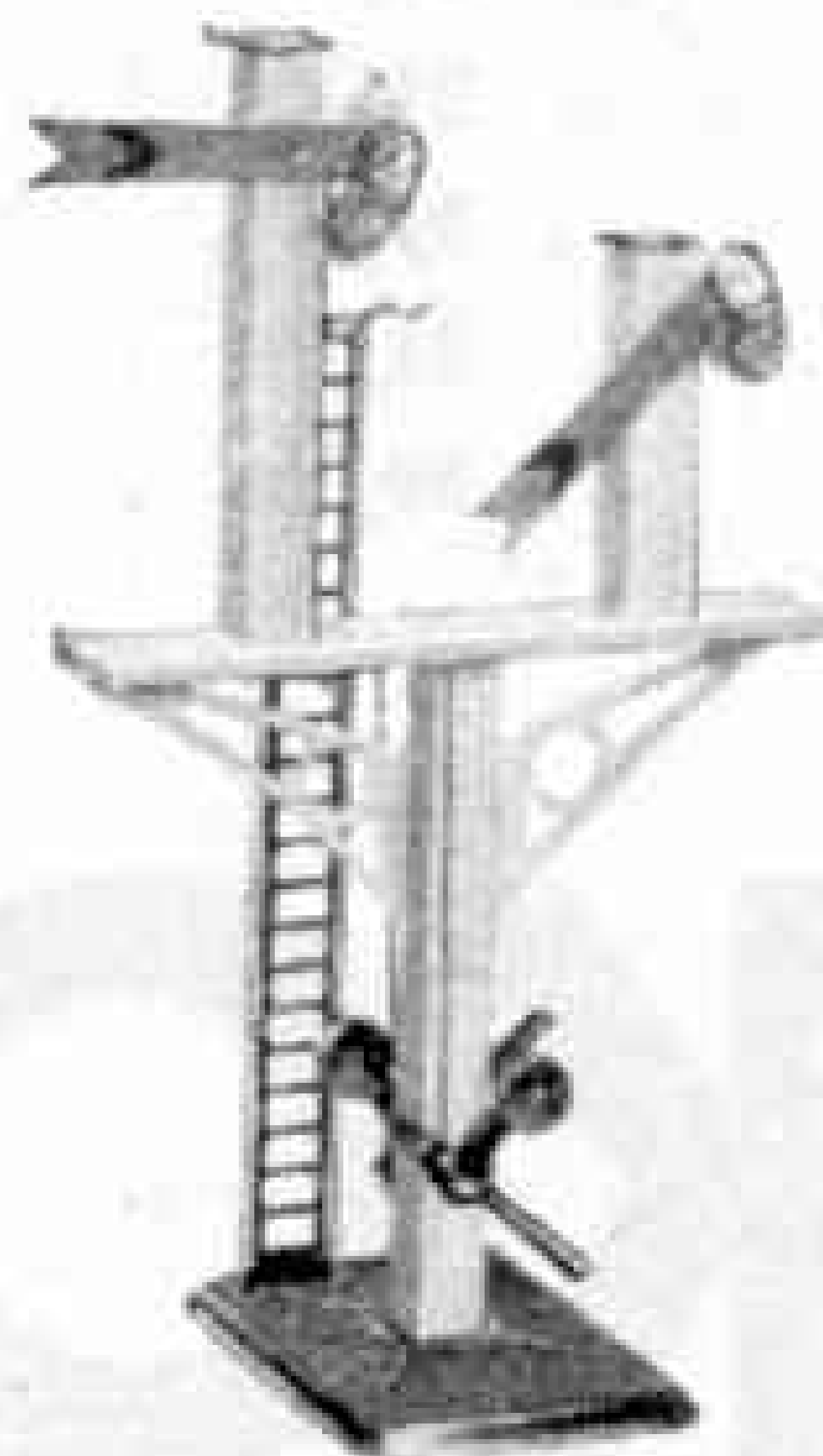
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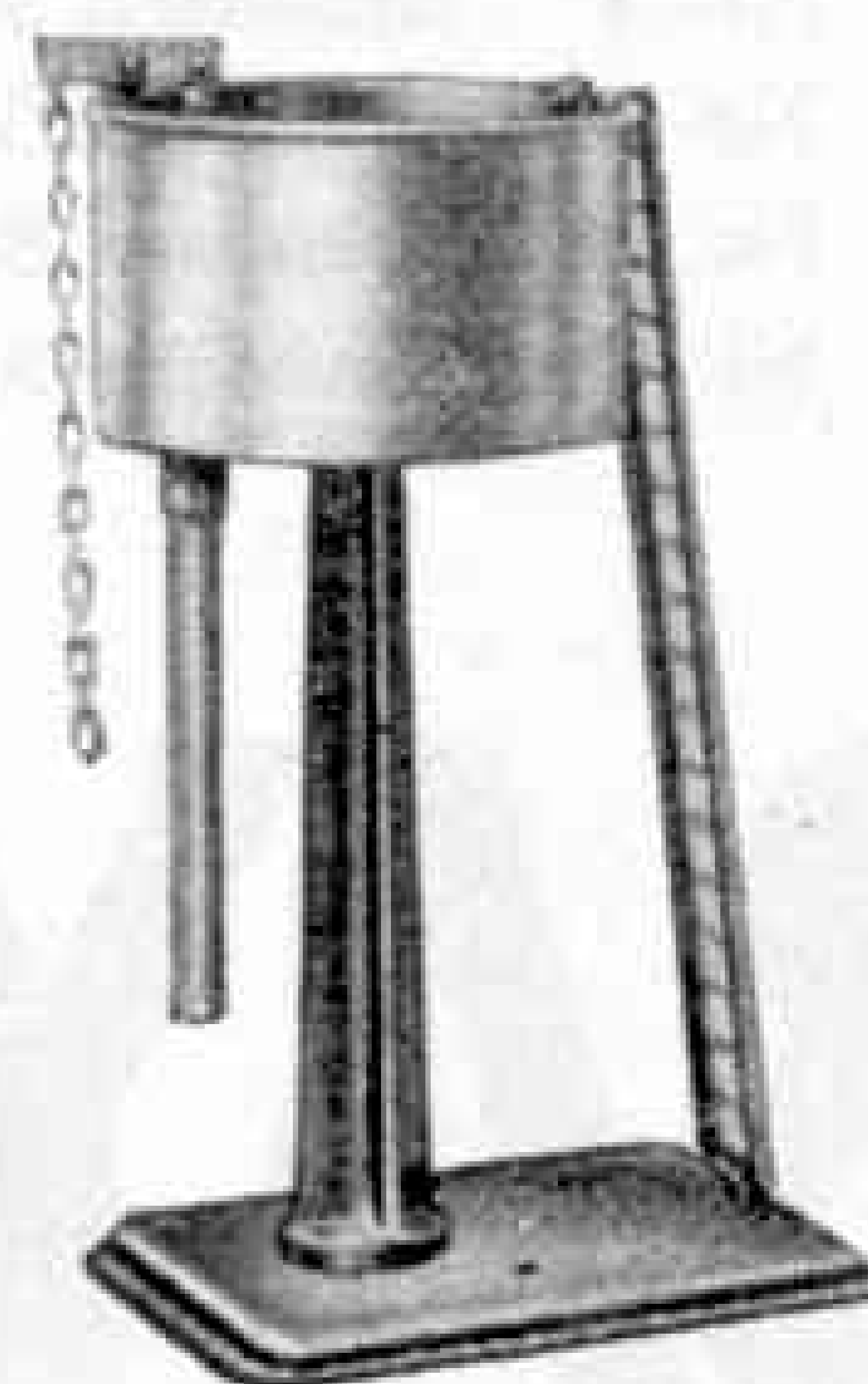
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MAGAZINE

Editorial Office:
Binns Road
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EDITOR : FRANK RILEY, B.Sc.

Vol. XLI
No. 1
January 1956

Best Wishes for 1956

Once again we are at the start of a new year. I hope that it will be one of progress and prosperity for every reader of the

I am very glad that I have been able to reproduce the picture on this page as my first for 1956. As you will see, it shows the

front and back—the obverse and reverse, to use the technical terms—of a medal, and all of you will have recognised this at once as the Victoria Cross. It is the very first, in fact. The immediate occasion for showing it to you here is that this month, on the 29th to be exact, the Victoria Cross celebrates its centenary.

Every conflict in which the forces of the British Commonwealth of Nations have been engaged during the past century has brought with it innumerable heroic actions, and those of the holders of the V.C. necessarily must have been outstanding. Whole volumes have been written about them, and the story of the award, this simple bronze medal with its plain ribbon, is worth telling at any time. You will find it on the next pages of this issue, with some very interesting illustrations, and the article contains much information that will be of the greatest interest.

Then there is Garco, who can do uncanny things. Is he the forerunner of a race of robots, and will somebody like him make the first trip into space? Read the article on page 24, and let me know what you think.



The Victoria Cross shown here in front and back views was the first ever won. It was awarded to Lt. C. D. Lucas, for bravery during the war with Russia in 1854-55. Lt. Lucas later became a Rear-Admiral. Photograph by courtesy of the Trustees of the National Maritime Museum, London.

Magazine, and for the Magazine itself. I shall do my best to ensure that the Magazine does make good progress during the coming twelve months, and I am sure that all of you will join with me in this, both by making the very best use of its pages for yourselves and by doing all that you can to make it enjoyable to others.

The Editor

For Valour

The Story of the Victoria Cross

By Leslie E. Wells

OF all the awards to the Services for bravery and gallantry in the field, none is coveted so much as the Victoria Cross, the first and rarest of decorations, which takes precedence of all other orders and medals. It was instituted by Queen Victoria a hundred years ago this month, on 29th January, 1856, to render honour to "conspicuous bravery or some single act of valour or devotion to the country in the presence of the enemy." The award originated from Queen Victoria's desire to acknowledge in some way the conduct of her soldiers who displayed

The first distribution of Victoria Crosses was made in Hyde Park, and here is a contemporary picture of the ceremony. "Picture Post" Library.

outstanding gallantry in the Crimean War.

Most of the provisions of the original Royal Warrant remain, but a number of other Warrants have since modified or extended its provisions. Originally the V.C. was intended to be awarded solely to officers and other ranks of the Navy and Army. Through the years, however, its scope has necessarily had to be enlarged to include other categories, such as the R.A.F., the Mercantile Marine, Indian soldiers, and "every rank and grade of all branches of H.M. Forces," Dominion and Colonial as well as women and civilians in certain instances.

The Cross could not be awarded posthumously until 1902, when King Edward VII approved the principle of the posthumous decoration to certain officers and men killed in the South African War. Indian officers and men of the

Indian Army did not become eligible for the V.C. until 21st October, 1911.

The most important and lengthy of V.C. Warrants is dated 22nd May, 1920, and bears the signature of Winston Churchill, then Secretary of State for War. Among the most notable provisions in this historic document is that mentioning members of the Royal Air Force, "Air Forces of our Dominions, Colonies, Dependencies or Protectorates," and "Matrons, sisters,



nurses and the Staff of the Nursing Services and Civilians of either sex serving regularly or temporarily under Orders or the direction of Naval, Military or Air Forces." The colour of the ribbon now became claret-red for all Services; previously the ribbon was blue for the Navy.

Probably the most historic day in the momentous history of the Victoria Cross was 26th June, 1857, when in Hyde Park the first investiture took place. Queen Victoria, mounted on a roan charger, was attended by her great officers of State and nearly 6,000 of her troops, and surrounded by a host of her loving subjects. Her Majesty pinned the new decoration to the left breasts of 62 officers and men.

The Queen's dress is reported as

delightfully colourful. It consisted of a scarlet tunic, gold-braided with a gold embroidered sash over one shoulder, a

There was no distinction of rank at this first parade. Twelve Naval V.C.'s were called forward first, then two of the Royal Marines, followed by 48 of the Army.

Every recipient of the Cross receives a not over-lavish pension of £10 yearly and if it is won a second time, a bar is granted carrying an additional £5

Captain C. Upham (N.Z.M.F.), one of the three men who have been awarded a bar to their Victoria Crosses, standing before King George VI at an investiture. To the left is Sergeant J. Hinton, V.C. (N.Z.M.F.).



annuity. Only three men in a hundred years have won a bar. All were officers; two of them were R.A.M.C. doctors and the third a New Zealand infantryman. It was decided in July 1898 that in cases of old

dark-blue skirt and a round black beaver hat, with a gilt band and red and white plumes.

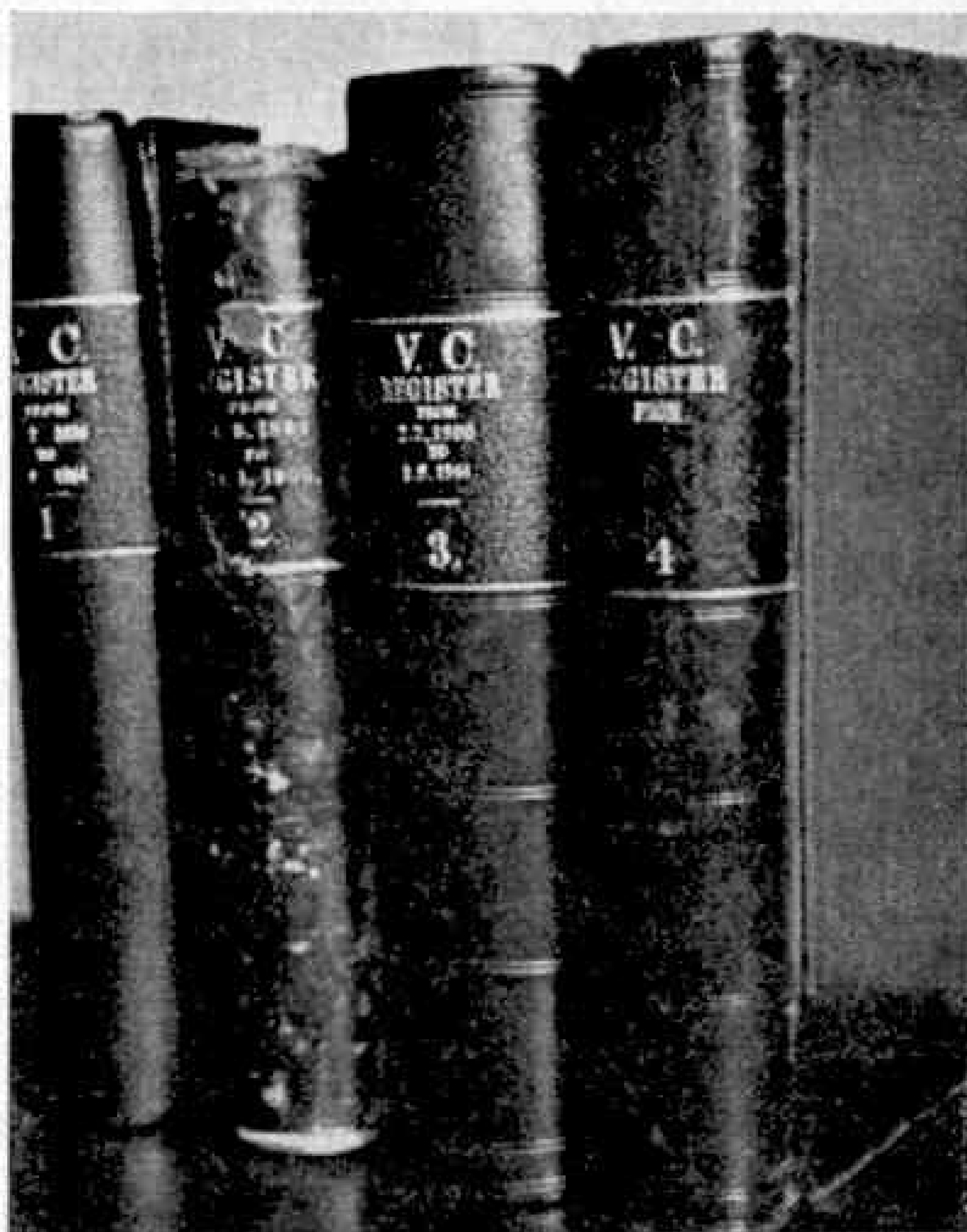
Awards had been back-dated, and one of the names on the list was that of Lt. Charles Davis Lucas, later Rear-Admiral, R.N., who performed the earliest deed to be rewarded with the Victoria Cross. On 21st June, 1854, during an attack on the fortress of Bomarsund in the Aland Islands, he seized with his bare hands a live shell that had landed on the deck of H.M.S. *Hecla* and threw it overboard. The shell exploded almost before it touched the water, but Lucas had saved his ship from great damage, if not total destruction. Though his was not the first name, his deed was the earliest to earn the award, and is to be looked upon as the first V.C.

age and poverty, a recipient could apply to the Home Secretary, who might in his discretion increase the annuity to £75.

Theoretically, the V.C.—or a number of V.C.'s—can still be awarded to a unit which has particularly distinguished itself, the officers and men then taking part in a ballot to decide which of their number actually receive the decoration. But no such "elective" V.C. has been awarded since the first World War.

It is a common belief among many people that a V.C. is beyond reproach, but this is not so. An expulsion clause still remains, though rarely used, whereby a recipient's name may be struck off the roll after conviction for "treason, cowardice, felony, or any infamous crime."

There is only one case on record of the Victoria Cross being



These four volumes form the War Office Register of V.C. Awards.

awarded for gallant services not in "the presence of the enemy." It was given to Pte. Timothy O'Hea of The Rifle Brigade, for extinguishing a fire in a railway car containing 2,000 lb. of ammunition during the Fenian Raid in Canada, 1866. The medal was sold in August 1900, for £50.

At least one feature of the Indian Mutiny was the eligibility of civilians for the Victoria Cross. One of these gallant civilians was Mr. Ross Lewis Mangles, Assistant Magistrate at Patna, who on 30th July, 1857, though himself badly wounded at Arrah, gave first aid to a wounded soldier named Richard Taylor under heavy gun-fire, and carried him on his shoulders for some miles to safety in the heat of the sun.

A characteristic of recipients of this most highly prized medal is their modesty and refusal to acknowledge having done other than what was expected of any man. But there are instances which have contained some special interest. Such was the case of Cpl. Henry Tandy, who won the V.C. in 1918. With a party of nine men, he held a post at Merrin for four days and eventually put the enemy to rout and captured several machine guns. One of the enemy was Hitler, whom Tandy might have bayoneted to death. Hitler was already a wounded man, however, and by Tandy's clemency was allowed to escape. During the last war Tandy remarked, "If only I could have looked into the future!"

The most recent award was to Lt.-Col. James Carne, who commanded the 1st Battalion Gloucestershire Regiment during its gallant stand in the Imjin River battle in Korea in 1951. His indomitable pluck and powers of leadership, state the official citation, "seldom has been surpassed in the history of our Army."

The design of the Victoria Cross is comparatively simple, and yet possesses a compelling attraction. It is a bronze Maltese Cross, with the Royal Crest in the centre and a scroll inscribed "For Valour." A V-shaped link connects it with a laureated bar, having on the back a space for the recipient's name. The date and details of the deed honoured are hand engraved on the back of the cross itself. The medal is worn suspended from the left breast by a 1½-in. wide red ribbon.

From time to time a Victoria Cross is auctioned and recently £43 was paid for



Victoria Crosses have been made here by hand since the award was established.

a lieutenant's won in the Indian Mutiny. A private's won before Sebastopol fetched £175.

There are several instances of "V.C. families," but the record goes to the Gough's. Major C. J. S. Gough and his brother Lt. H. H. Gough both won the award for gallantry in the Indian Mutiny, and Major J. E. Gough, the son of the former, won it in Somaliland in 1903. In two cases both father and son have received the award. Lord Roberts won it in 1858, during the Indian Mutiny, and his son Capt. Roberts in South Africa in 1900. Capt. W. N. Congreve in 1909 and his son, Major W. T. Congreve, were posthumously awarded the Cross in 1916. In the last war 183 awards were made, 83 of which were posthumous.

The youngest person ever to receive the V.C. was 16½ year old boy John Travers Cornwell, R.N., of H.M.S. *Chester*, who during the Battle of Jutland remained standing at his gun surrounded by dead and wounded—himself mortally hurt, but awaiting further orders. His deed captured the imagination of people throughout the world.

The V.C. has another (Continued on page 58)

Steel Analysis in a Minute

A New Production Control Instrument

THE instrument seen in the picture on this page is a quantometer and is the first of its kind to be installed in a British steel works. It is now working nearly 24 hours a day in a laboratory at the works of Steel, Peech and Tozer Ltd., Rotherham, where it provides analyses of samples of steel in a very short time. Taking the sample to the laboratory occupies about four minutes, its preparation requires two minutes, and the actual analysis is completed in a minute. The results can be despatched in less than two minutes, so that the time required for the complete exercise is only about nine minutes.

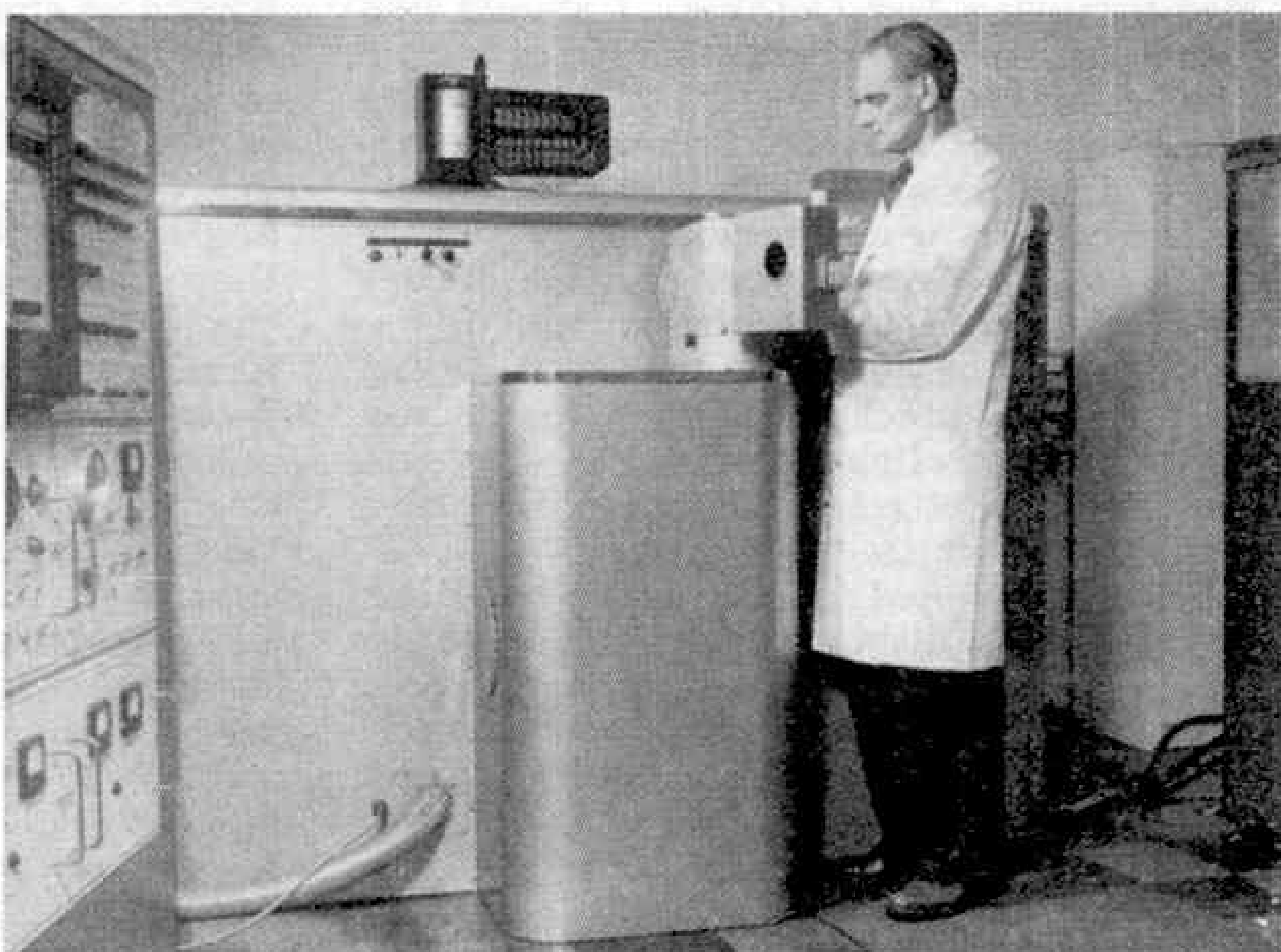
The former practice in steel works was to analyse samples of steel chemically, and this required considerably more time than is taken on the quantometer, which is of comparable accuracy. So the instrument can be used for production control at all stages of the making of steel.

The quantometer analyses samples of steel spectroscopically. It differs from the spectroscope familiar in chemical laboratories in schools in that the spectrum is not examined by the eye, through a telescope, nor photographed on a plate. Instead, the lines in it are isolated by means of slits and focussed by mirrors on to photo-tubes, which measure the intensities of the lines electrically.

A motor generator supplies power to a

spark-gap, one electrode of which is formed by the sample, the other being of graphite, and the spectrum is produced by a grating ruled with 24,400 lines to the inch.

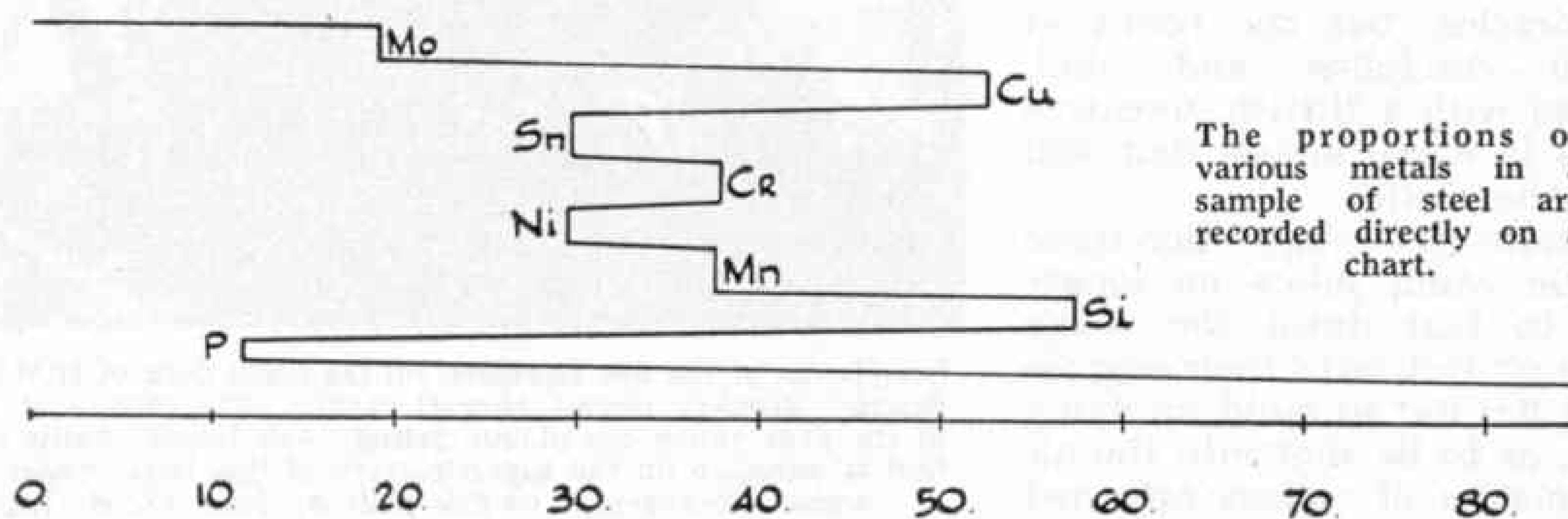
The whole installation is housed in a room with special air conditioning equipment. The temperature in this is maintained within 2 deg. F. of 70 deg. F., and the relative humidity is kept at 50



The quantometer, an instrument for the rapid analysis of steel samples.

per cent. plus or minus 5 per cent.

The results of an analysis are recorded as steps on a chart, the height of each step representing the concentration ratio of an element in the steel sample. From this chart, an example of part of which is seen in the lower illustration on this page, the percentages of the various elements present in the steel can be read off directly.



The proportions of various metals in a sample of steel are recorded directly on a chart.



Aboard H.M.S. "Ark Royal"

By John W. R. Taylor

THE Admiralty invited me to spend a day at

sea aboard H.M.S. *Ark Royal* just before she sailed for Gibraltar and the Mediterranean last October. I should like to tell you about it, because a lot of people who ought to know better are saying nowadays that aircraft carriers are out-of-date. They insist that, in any future war, all the carriers would be sunk very quickly with atomic bombs and guided rocket weapons. But they do not explain why a ship moving at 30 knots over vast oceans should be so much more easy to destroy than the sprawling, immovable, concrete runways and steel hangars of the land aerodromes which they prefer!

The *Ark Royal* is the biggest British carrier, with a displacement of 36,800 tons. But, to anybody who is used to the two-mile runways at London Airport, it is a miracle that pilots are able to land 600 m.p.h. jet fighters and 9-ton anti-submarine aircraft on a patch of steel only 808 ft. 3in. long and about 100 ft. wide, which may be pitching up and down 70 ft. above a stormy sea. In fact, it seems a wonder that they can ever find the ship at all; because a single-seat fighter carries very few navigation aids and its "aerodrome" might easily be 60 miles from where it was when the pilot took off.

When I had been aboard the ship for an hour or two, I began to realise that these things were no miracles, but the result of superb discipline and skill, coupled with a British inventive genius in naval affairs that still leads the world.

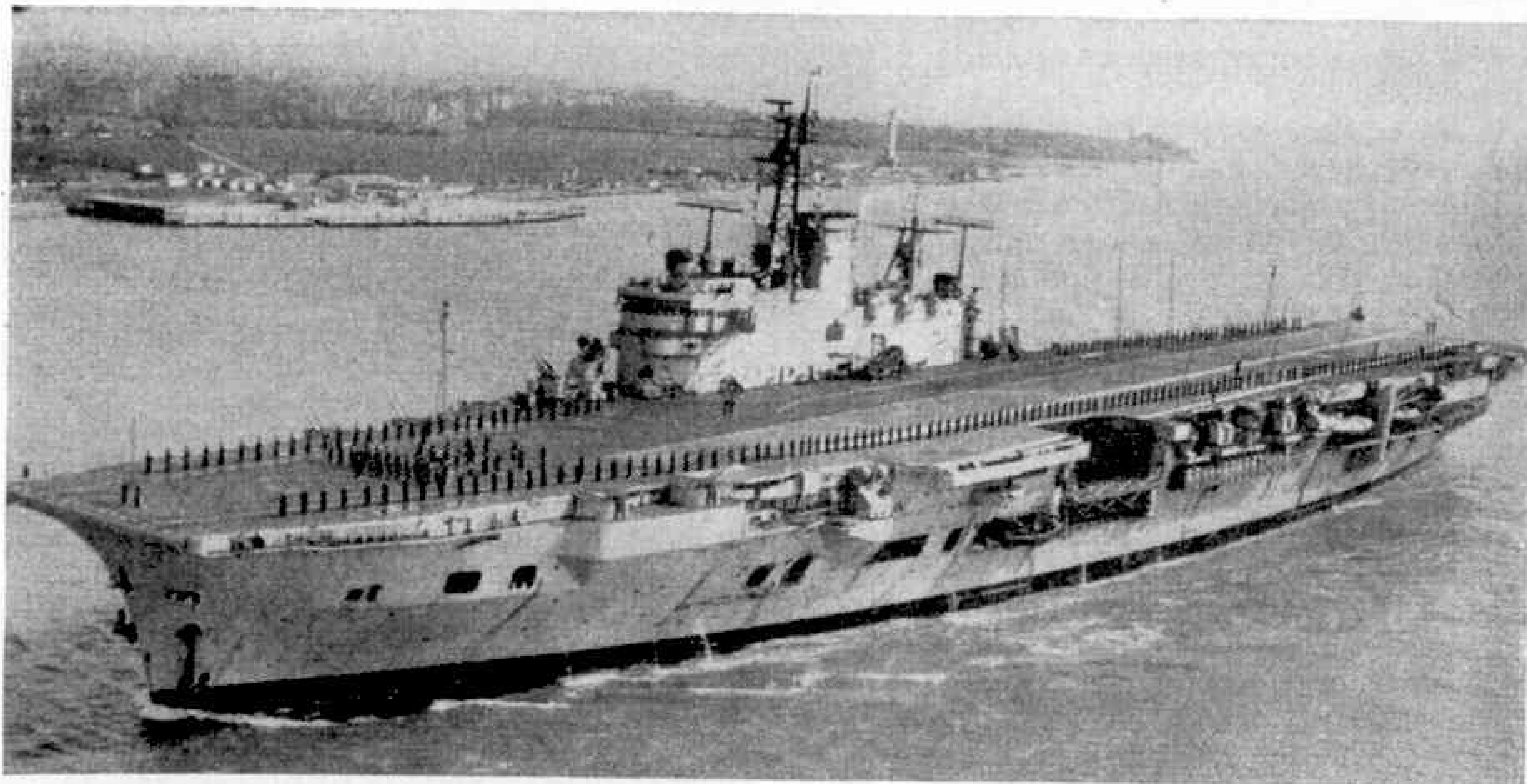
At take-off on days when there is little wind, pilots no longer have to tear down the whole length of deck with their engines racing flat out to build up flying speed, or to be shot into the air by a cluster of rockets attached

to their aircraft. They simply hook a cable from one of the powerful steam catapults on the foredeck to the underside of their fuselage and are flung into the air smoothly and safely.

Similarly, if a pilot misses the arrester wires that bring his aircraft to a sudden stop on landing, he no longer faces the hazard of smashing into a crash barrier or other aircraft. H.M.S. *Ark Royal* has an angled deck, invented by her present commander, Captain D. R. F. Cambell, D.S.C., R.N., and aircraft land at a slight angle across the deck. If they miss the wires they simply continue on, past the side of the ship, and try again. The *Ark* does not have a fully-angled deck. She was laid down 12 years ago, and completion was delayed so that the deck could be extended over some of the gun positions on the port side, giving a landing deck angled at $5\frac{1}{2}$ degrees to the centre-line. It would have been too costly in both time and money to have incorporated the full eight degrees; and the main loss is that fewer aircraft can be ranged on the fore-deck during landing



Sea Hawks of No. 898 Squadron on the flight deck of H.M.S. "Ark Royal," Britain's largest aircraft carrier. The picture at the top of the page shows the plaque listing "Ark Royal" battle honours that is mounted on the superstructure of this latest vessel of that name. Photographs on this page by John W. R. Taylor.



operations than if the deck had been fully angled.

In addition, the side lift which carries aircraft from the below-deck hangars to the flight deck cannot be used during landing operations, because it forms part of the angled deck. This is a pity; because it is the first ever fitted to a British carrier, and its whole purpose is to permit aircraft to be carried up and down while the main deck, containing the two ordinary lifts, is in use.

Another of the fine new inventions fitted to the *Ark Royal* is the mirror landing aid, which replaces the familiar deck landing officer or "batsman."

A pilot coming in to land has only to keep a row of lights reflected in the mirror lined up with bars of lights on each side, and he knows he is approaching the deck at exactly the right angle and attitude for a perfect touch-down.

Like the steam catapult and angled deck, the mirror landing aid has improved the efficiency and reduced the accident rate of deck operations. All three were designed in Britain, and all have been adopted by the U.S. Navy.

I knew quite a lot about these features before I visited the *Ark Royal*: but others were entirely new and very surprising. For example, with my fellow guests, I was invited to meet the captain: but not in the usual way. We were taken into one of the messes, sat down and almost jumped out of our skins when Captain Cambell suddenly began talking to us from the screen of a television set.

We learned that the *Ark* has her own

private TV network on a closed circuit that can broadcast to any number of receivers throughout the ship. At the moment there are only six, bought with the crew's own cash and by gifts; and the system is used solely for entertainment, both "live" shows and films being transmitted from a small TV studio. But, in time, the system may have important operational uses. A single briefing crew could, for example, discuss the plans for a forthcoming attack simultaneously with aircrew in the three briefing rooms dispersed throughout the ship, without any fear of the conversation

being picked up by outside receivers.

Even more important are plans that have been made to keep the ship in fighting trim after

an atomic bomb attack on the fleet. The entire propulsion machinery can be controlled from two small remote control rooms deep inside her hull. Each room is linked with the engines driving two of the vessel's four screws through a simple hydraulic system which reduces all the usual engine room knobs, wheels, dials and other controls to a neatly laid-out bank of levers and gauges.

If the carrier were unlucky enough to be caught in the radio-active fall-out area of an atomic attack, she would be sealed immediately to prevent outside air and spray being drawn into her air-conditioning system. The engine rooms would soon have to be left, because the temperature in them would become unbearable without fresh air: and the ship would then be controlled from the remote control rooms, to get her

The above fine view of H.M.S. "Ark Royal" shows the great length of her flight deck. Official Admiralty photograph.

out of the danger area as quickly as possible

It sounds too easy to be true: but the *Ark Royal* has already been brought to anchor in Sandown Bay, off the Isle of Wight, under remote control in this way, with nobody in the engine rooms.

By about mid-day, my legs were beginning to ache, after walking along miles of narrow, spotlessly clean and sparkling corridors and climbing countless ladders to get from one place to another on the ship's ten decks. But it was all very worthwhile. Carriers have been likened to floating cities, and this is little exaggeration, for H.M.S. *Ark Royal* carries 2,200 officers and ratings, and even has her own Land Rovers to transport her men and supplies at overseas ports. The squadron commanders, preferring to be independent, have their private vehicle in the shape of an ancient London taxi-cab, which is kept in one of the two hangars.

For those who like figures, there are 750 miles of electric cable in the ship, involving a million electrical connections and supplied by more than 1,000 motors. Among the items they power are washing, starching and ironing equipment in the laundry; dish-washing, potato peeling and chipping,

mincing and slicing machines in the galleys; and machines for pie-making and dough-kneading in the bakery.

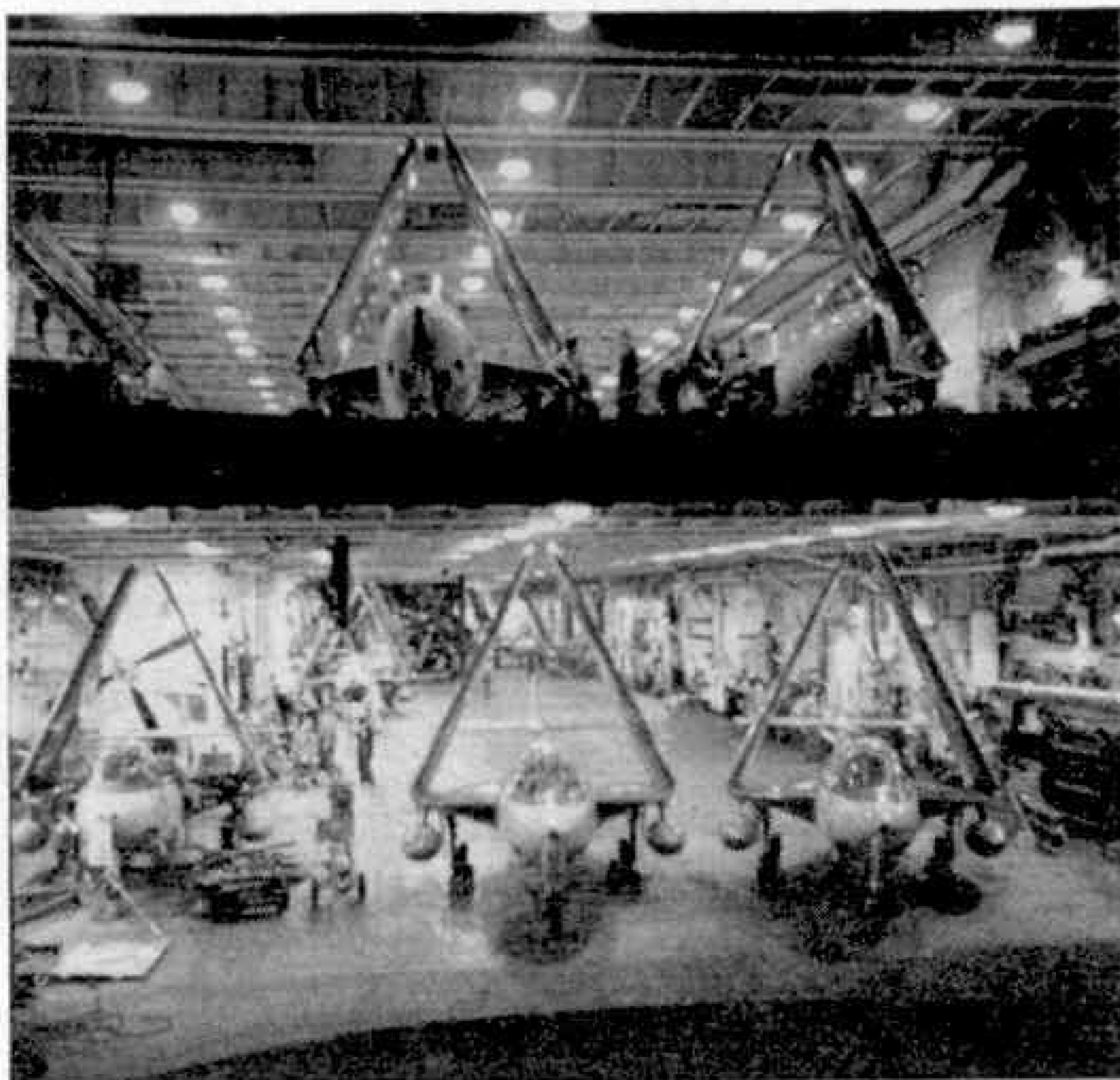
There are beautifully equipped sick quarters and operating theatre, with a door which opens out on to one of the huge deck lift wells, so that casualties could be carried down quickly from the flight deck in combat. It was from

this door that I got the view that impressed me more than anything else with the size of the new *Ark Royal*. On the other side of the dark gloom of the lift well, I could see the ship's two vast hangar decks, one above the other, as brightly lit as a London underground railway station and with rows of Sea Hawk fighters stowed with their wings folded on each deck, waiting for flying operations to start.

Later, I watched these same Sea Hawks of Nos. 800 and 898 Squadrons being catapulted into the air, after which a flight of four from No. 800 performed as exciting a display of aerobatics as one could wish to see. No less impressive was the beautiful formation flying by the *Ark's* Gannet anti-submarine aircraft of No. 824 Squadron.

Also aboard were "B" Flight of four Skyraider early-warning aircraft of No. 849 Squadron, with enormous radar

(Continued on page 58)



(Above) Sea Hawks on the "Ark Royal's" two hangar decks, viewed across one of the deck lift wells from the door of the sick quarters. (Below) Here a Sea Hawk of No. 898 Squadron is seen on the deck of this great carrier. The photographs on this page are by John W. R. Taylor.



The Sugar You Eat

By David Curnock

The author, who is Editor of "Tate & Lyle Times," describes how raw sugar is treated to give not only pure white sugar, but also the many forms of sugar and syrup required for special purposes. The illustrations are reproduced by courtesy of Tate & Lyle Limited.

THE sugar you eat is a natural food formed by the combined action of the Sun and carbon dioxide on the green leaves of plants.

There is sugar in all plants, but it is economic to produce it only from the sugar cane, which grows in tropical climates with fairly heavy rainfall, and from the sugar beet, which grows in all temperate climates. About 600,000 tons of the 2,500,000 tons required annually in

eat it. The essentials of refined sugar are that it must be pure—in fact, it is the purest food we know—cheap and plentiful, for it is a vital part of our daily diet and contained in almost everything we consume.

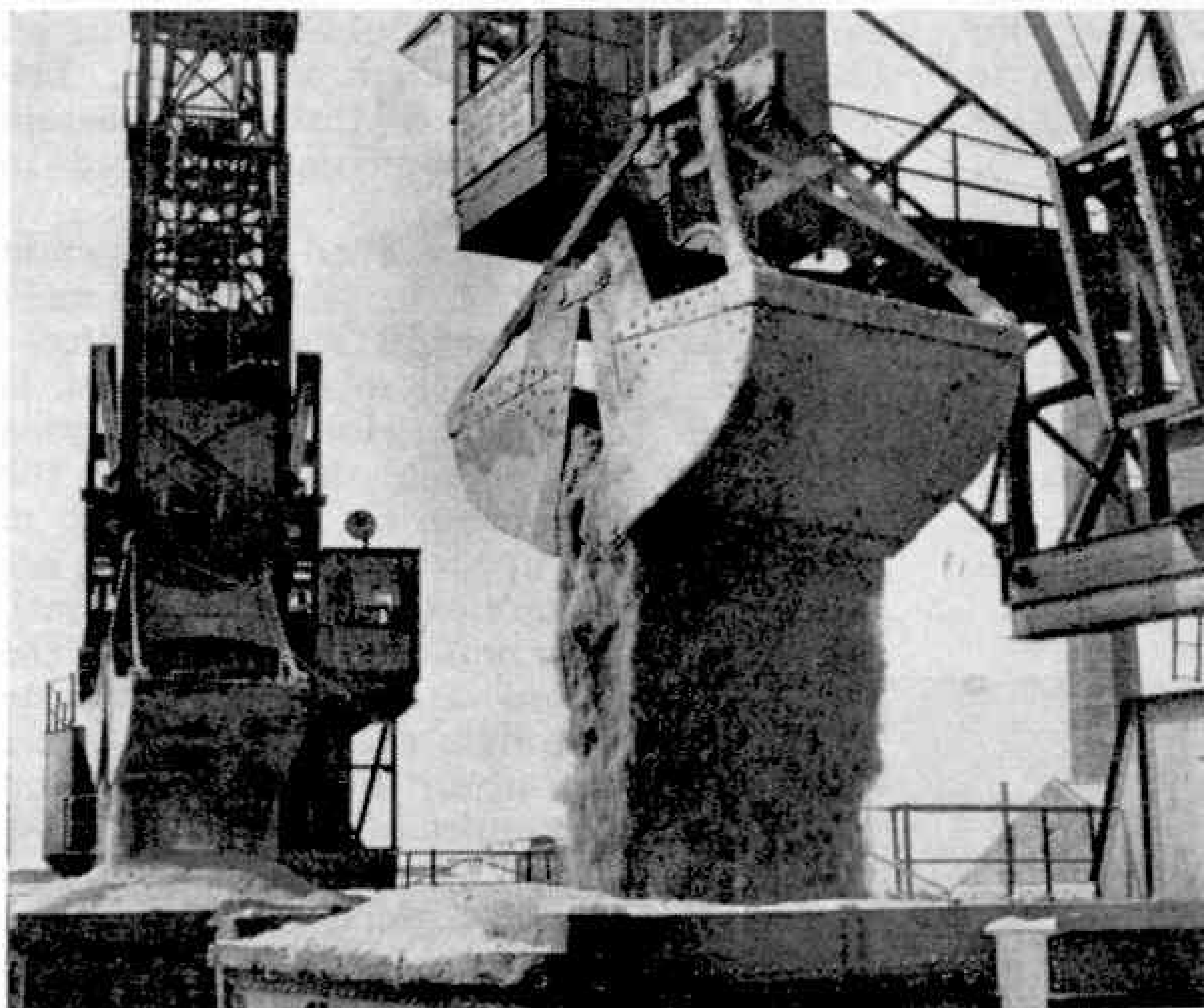
Sugar refining is a long, expensive and somewhat complicated process. Because of the vast quantities to be distributed to millions of homes and hundreds of manufacturers daily it is one of the most highly mechanised industries of the age.

The sugar arriving in Great Britain in its raw form looks very much like damp sand; it is picked up from the holds of bulk-carrying sugar ships by giant grabs and conveyed direct from the wharfside to the refineries.

The first process it undergoes is known as "affination," which means removing the film of syrup from the tacky raw crystals, leaving behind only hard crystals. This is done by mingling the raw sugar with a warm raw syrup to form a mixture known as magma, which is run into centrifugal machines spun between 750 to 1250 revolutions a minute.

In these machines are cylindrical baskets of fine meshed gauze, about four feet in diameter and three feet deep, each basket

supported by a central steel spindle. As the speed of the machines increases, so by centrifugal force the warm syrup is thrown off through the outer casing of the basket while the hard crystals are retained inside the wire, to form after about six minutes spinning a wall of sugar four to five inches thick. The adhering sugar, sprayed with water, is dropped into a receiving tank below, dissolved in hot water and partially strained through a coarse screen, and



Giant crane grabs discharging raw sugar into hoppers, which feed it on to conveyors that carry it into the refinery.

the United Kingdom are obtained from home-grown beet. The beet industry in an island country such as Great Britain is maintained partly to ensure limited supplies of sugar in the event of war, and also because the sugar beet is a rotation crop that cleans and feeds the ground.

As the crude oil that gushes from wells has to be refined before use, so raw sugar has to be stripped of impurities before it reaches the refined state in which you

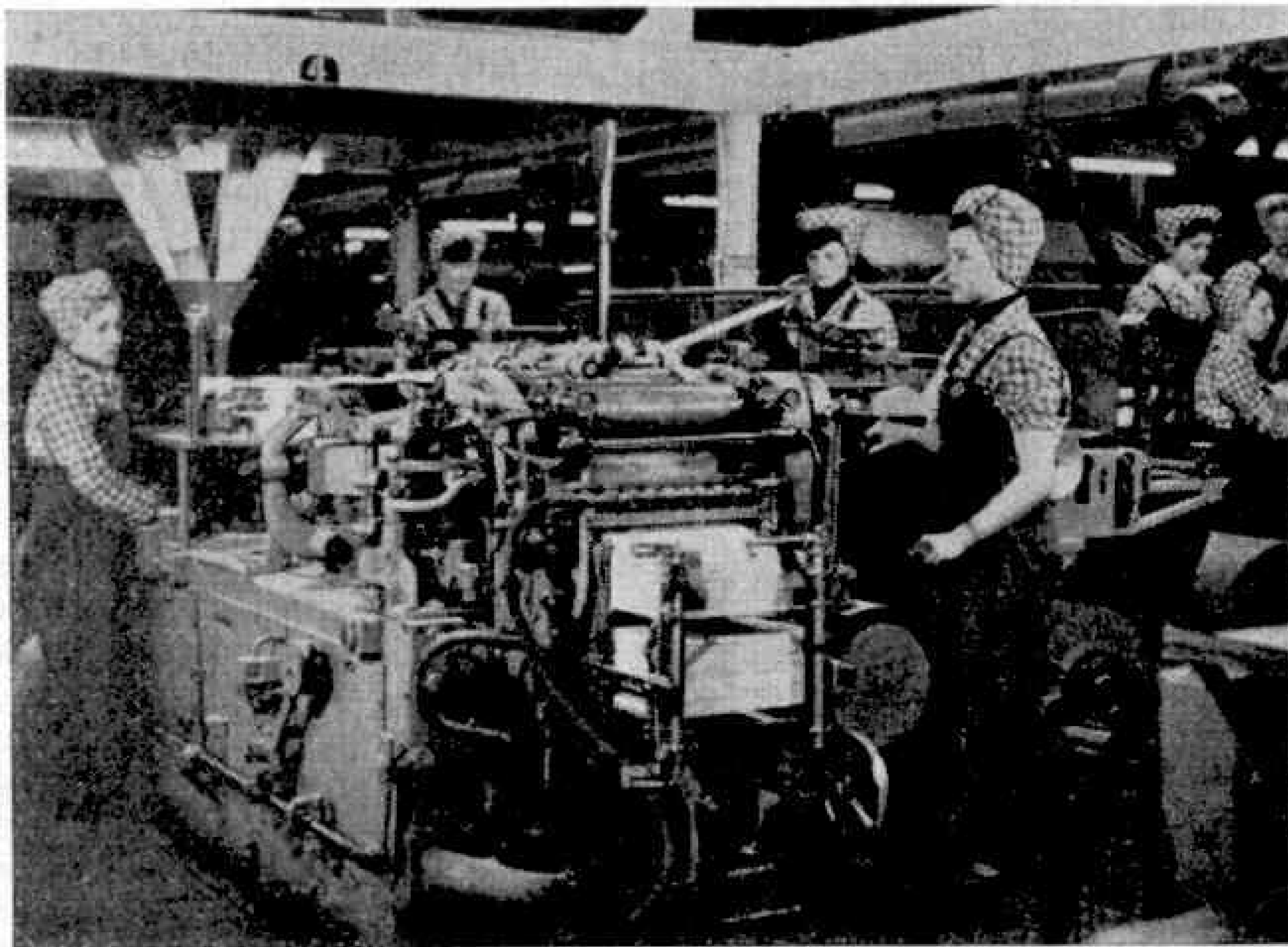
High-speed machines pack and seal cartons of sugar at the rate of two a minute.

the raw liquor is passed into storage tanks for the next process.

The raw syrup spun off in the centrifugal machines still contains sugar, which is recovered by a crystallisation process carried out by boiling in giant vacuum pans, and then spinning again until as much sugar as possible has been extracted. The remaining liquor is known as molasses, and is used by distillers and cattle food manufacturers.

This process of recovery is a side-line, but is nevertheless very important, for wastage in refining must be cut down to the absolute minimum. Failing this, a refiner would go bankrupt in a year, or else the price of your sugar would soar like a rocket.

Let us return now to the raw liquor, from which many impurities have been removed. It is a brown solution in which there are still impurities, some insoluble and suspended, others in the form of soluble salts mostly picked up from the soil or fertilisers. These are removed in the next process, which is "carbonatation."



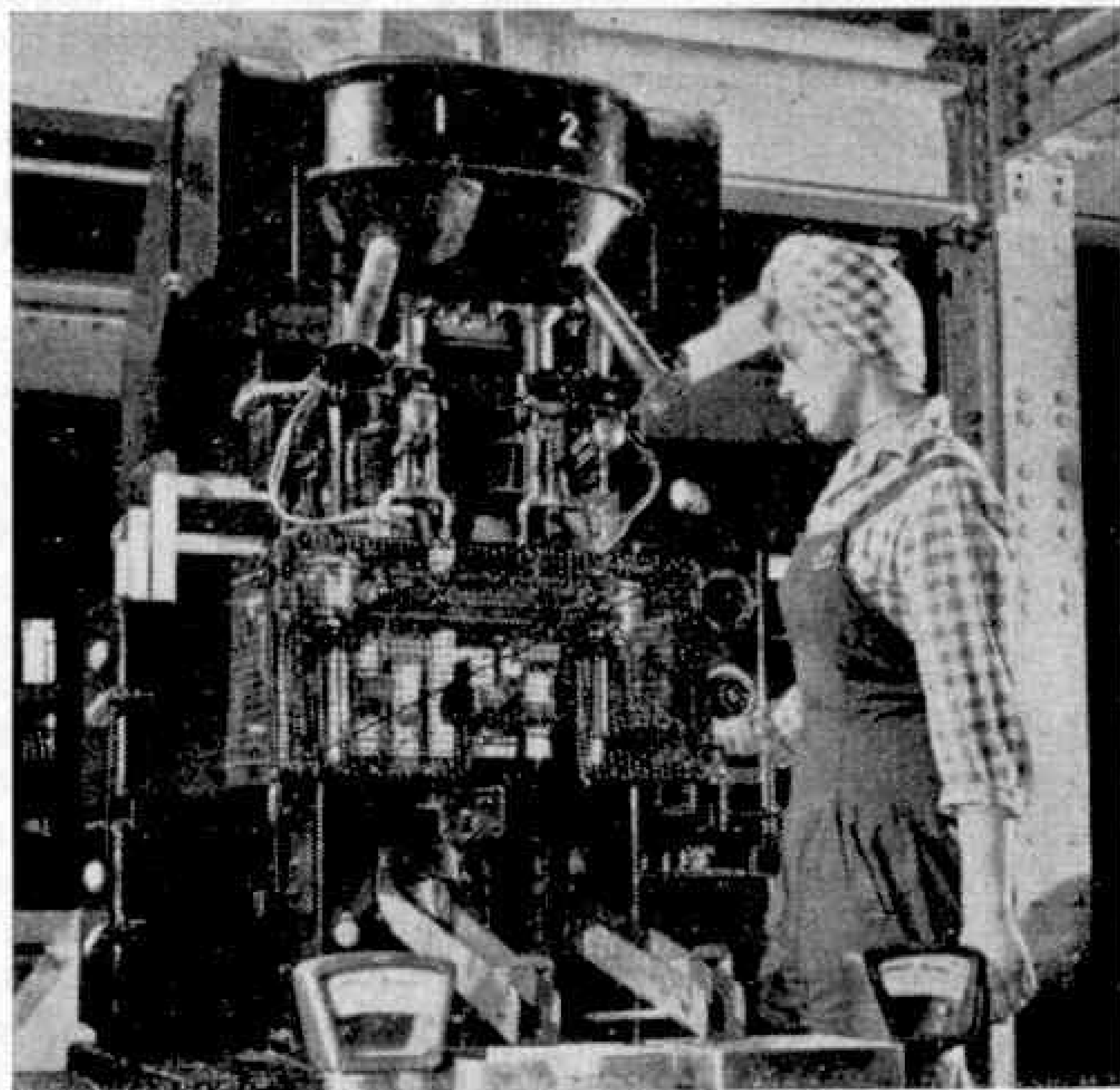
For this the raw liquor is run into enormous tanks to which milk of lime is added, and carbon dioxide gas is bubbled in until all the lime is precipitated as chalk. The whole is then passed through pressure filters to remove impurities collected in the chalk.

The liquor emerges clear and amber in colour and passes on to what is the most important operation in sugar refining—filtration. This takes place in what is known as the "Char House," so named because bone charcoal is used in the process. Tanks from six to ten feet in diameter, and up to 20 feet high, are filled with as much as 40 tons of charcoal.

The amber liquid is passed into the top of these cisterns. As it slowly trickles through, the colour and other remaining impurities are absorbed by the tiny granules of charcoal.

Obviously this charcoal, which has been specially prepared, cannot be used indefinitely, for it ceases to retain its properties of purification as it becomes saturated with impurities. When this happens, usually after 72 hours of use, it is revived by passing through vertical retorts which are heated to a temperature of 400 deg. C.

The solution emerging after filtration is pure and crystal clear—a refined liquor from which a variety of sugars is made.



Machines like this fill cellophane envelopes with measured quantities of sugar, for use in restaurants, on railways and in aircraft.

Whatever the type of sugar to be made, whether cubes or granulated, icing or preserving, coffee crystals or caster, the next operation is boiling in vacuum pans. To prevent the heat from destroying the sugar and causing colour-formation, this boiling is carried out as rapidly as possible at low temperature under a vacuum. The vacuum pans hold as much as 60 tons of liquor and in them the liquor is boiled under a vacuum of about 25 inches by means of heat supplied through steam coils—or a steam chest—known technically as a calandria. Sugar boiling is a highly skilled job carried out by "panmen." It is largely the knowledge and skill of these panmen that permits the production of the wide variety of crystals to make the different speciality sugars.

The boiling at this juncture is carried on until the solution is supersaturated, when it is known as a massecuite. It is run off from the pan and spun in centrifugal machines to yield pure white sugar.

The syrup spun off after the first boiling may be evaporated in the pans again, and re-spun to produce a second and a third crop of white sugar. The syrup remaining after the third boiling yields the moist brown sugar known as "pieces" or brown sugar, or sometimes quite incorrectly as "Demerara." The latter is not a refined sugar, whereas "pieces" are. In the north of England, particularly in Liverpool, the brown sugars corresponding to pieces are called "fourths" and "primrose." These brown sugars are used largely by the confectionery trade and by biscuit manufacturers and brewers.

Incidentally, Lyle's Golden Syrup, which quickly became world-famous when it was first produced in 1882, is based on the syrup that remains after the fine liquor has been boiled a number of times. The liquid is too fluid for use, and is not of constant colour. In order to get a thick enough syrup for table use, it is

supersaturated again by boiling, so that it does not contain more than $16\frac{1}{2}$ per cent. of water. The glorious golden colour is obtained by several filtration processes through charcoal, while the distinct flavouring results from the small quantities of non-sugar associated with the sugar cane, all of which, in the refining process, have been freed from any harmful elements that might be present were it not refined.

Now we have the refined product—white sugar. There is, however, still about one per cent. of water in it, and this is removed by passing it through granulators or large rotating drums through which hot air is drawn.

All that remains now is for the sugar to be packed. This is an enormous problem, for up to two million packets a day have to be filled

and despatched to the grocers, while in addition there are some 200 manufacturers requiring thousands of tons of sugar in order to keep their production lines moving.

To keep pace with this tremendous demand the latest and fastest packing machines have been installed at Tate and Lyle refineries in London and Liverpool. Depots have been established in different parts of the country as links in the chain of distribution, to ensure that it is carried out speedily and efficiently, yet cheaply.

At one of the London refineries of Tate and Lyle there are rotary presses for printing wrappers, and lithographic presses for colour-plate printing, while cans for syrup are also made on the premises. Packing materials generally cost more than £2,500,000 a year.

In the light, airy packing departments of the refineries, covering acres of floor space, high-speed machines capable of making, pre-weighing sugar, packing and sealing cartons up to the rate of two a minute, are continuously operating on a daily two eight-hour shift basis, watched over by girls in trim, gaily coloured uniform overalls.



Filling tins with the required quantities of Golden Syrup.

Road and Track

Successful British Racing Cars

By Peter Lewis

INTEREST in the Motor Show and enthusiasm about Stirling Moss's victory in the Targa Florio meant that a dual British achievement on 23rd October received very little praise in our national Press. I refer to the brilliant victory of twenty-three year old C. A. S. Brooks with a Connaught in the Syracuse Grand Prix, a combination that defeated a field of thirteen continental machines. Admittedly Mercedes-Benz were not present, but a powerful works Maserati team was there, led by Musso and that master of the art, Villoresi.

In London I talked to Les Leston, the driver of the

Colin Chapman—designer, constructor and driver—at the wheel of a Mark IX Lotus. Photograph by courtesy of "The Autocar."

other works Connaught at Syracuse, and he quickly

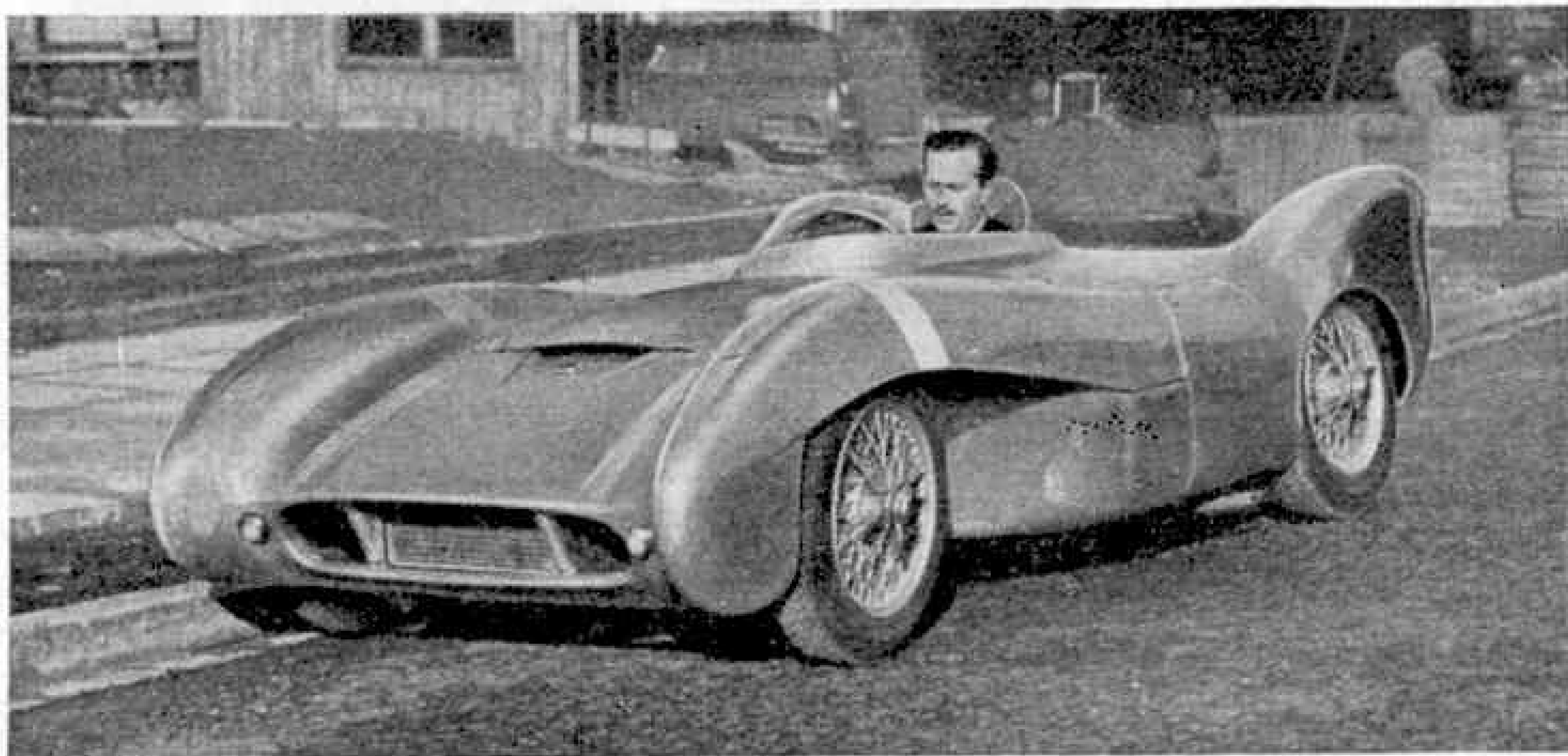
convinced me that this was no easy race to win. "It is a tricky circuit," said Leston, "fast and rather bumpy with a hairpin, two second gear corners and some 'flat out' swerves. Low brick walls flank the 3½ mile circuit for three quarters of its length, demanding maximum concentration."

The Sicilian crowd of 40,000 was greatly impressed by the cool driving of Brooks, who incidentally was at the wheel of a Formula 1 car for the first time. He not only won the race by the convincing margin of 51 seconds, but also raised the lap record by three miles an hour and the race average by nearly four miles an hour. "His handling of the car was masterly," said Leston, "and one of the first people to congratulate him after the race was second place man Musso."

There is no doubt that C. A. S. Brooks, on his form at Syracuse, is capable of taking on the top flight drivers in 1956,

and yet when I spoke to him he was more concerned about his final examinations. "Motor racing is very much a sideline with me," said Brooks. "I have to work jolly hard as a dental student."

I hope we shall see a lot of him this season in Formula 1 races, and at the wheel of an Aston-Martin works car, and that the sport will become more than just a sideline. It was only last August at the Crystal Palace that Brooks drove a racing car, a 2 litre Connaught, for the first time. Less than three months later he became



the first British driver in the history of motor racing to win a ranking Grand Prix on a car of British design and manufacture. Sir Henry Segrave's victory in the French Grand Prix of 1923 was admittedly on a British Sunbeam, but the engine was designed by an Italian.

Incidentally, I found that, like Stirling Moss, this quietly spoken young man from Dukinfield, Cheshire, is teetotal. Unlike the British champion, who smokes four or five cigarettes a day, Brooks is also a non-smoker.

As a member of the Guild of Motor Writers I was able to go down to Goodwood on Motor Show Test Day and, with other British and foreign journalists, take the latest British cars round the circuit. In four hours I drove fourteen different cars, each one for three laps, and these included the new Jaguar 2.4, the Mark VII with automatic transmission and the XK140.

An all-British victory at last. C. A. S. Brooks in the victorious Connaught takes the chequered flag at Syracuse.

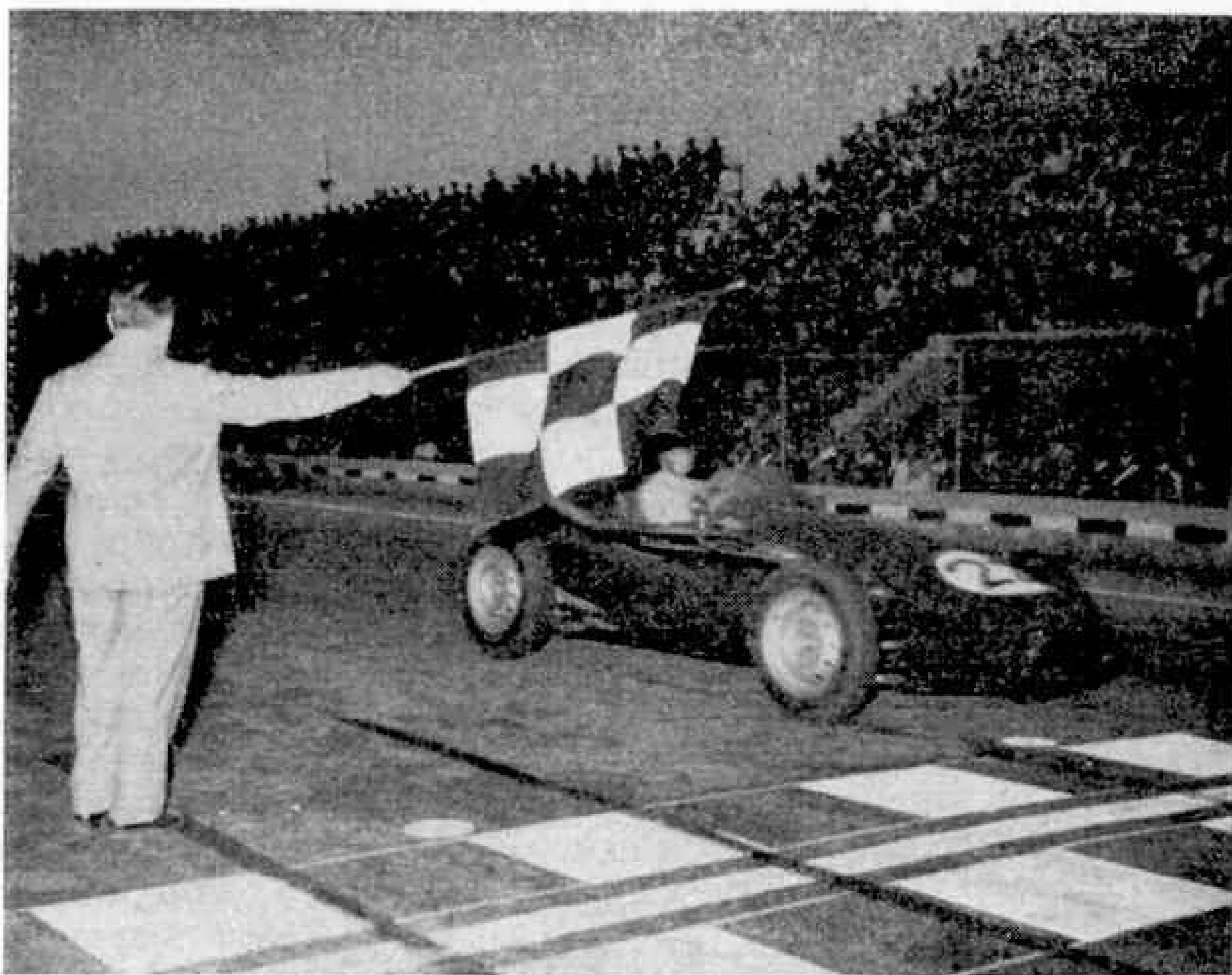
I must admit that I lost my heart to the XK140, a truly magnificent motor car with exhilarating acceleration and superb road-holding and steering. Lapping Goodwood, a rather tricky circuit, at speed was effortless and with one of the new M.G.'s on our tail we had one exhilarating burst down Lavant Straight when, in order to pass an Austin Healey, the XK140 was very near to the 100 m.p.h. mark. This is a fast car that inspires complete confidence.

The new 2.4 Jaguar—another hundred mile an hour car—is delightful to drive, although three laps round Goodwood leaves one with only a sketchy impression. The stubby central change gear lever is a pleasure to use, the smoothness of the power unit is very noticeable, and the vivid acceleration, particularly in third gear, and the roadholding are in the best traditions of the Coventry firm. Compact, fast and functional, the new Jaguar should be a world beater.

I did not take the 2.4 round as fast as I might have done, for my three rear seat passengers were Ivor Bueb, John Cooper (of Cooper cars) and Colin Chapman: not rear seat drivers by any means; but a steadying influence on enthusiastic journalists such as myself!

When we returned to the paddock Colin Chapman invited me to visit the Lotus works in Hornsey, London, and I readily accepted, for few sports cars in recent years have established such an outstanding record for exceptional performance and reliability as those assembled from Lotus components.

The enthusiast who wants to build a high performance car at minimum expense can



purchase Lotus components from Hornsey and assemble his own car, with the power unit and gearbox of his choice, from the five types of engine and two types of gearbox which the multi-tubular space frame is designed to accept.

Weighing only 63 lbs., and designed like all the Lotus components by 27 yr. old Colin Chapman himself, the frame is the basis of the conventional Mark VI two seater body and the fully aerodynamic Mark IX body with twin stabilising fins, which has a maximum speed of 130 m.p.h. powered by the Coventry Climax engine, and put up some astonishing performances last season on circuits at home and abroad.

The works at Hornsey, not large by any means, but an absolute hive of enthusiastic activity, produce components to match the frame. These include a de Dion rear axle, hydraulically operated disc brakes, swing axle independent front suspension, steering gear, a special radiator, lightweight wheels and exhaust silencers.

Lotus components were produced for the first time three years ago. It was the Mark VI only in those days, and I well remember how their fantastic cornering and roadholding impressed the motor racing crowds.

(Continued on page 58)



C. A. S. Brooks, who drove the winning Alta-engined Connaught in the Syracuse Grand Prix.

Polar Boats

Ships that Drive Through Ice

By Frank Illingworth

HOW the olden-day polar explorers would marvel at the gear packed into a modern polar boat—echo-sounding apparatus, direction-finding and loran equipment, long and short-range radar, gyro compasses for navigation in the magnetic areas of the Far North and Far South, searchlights for operation in the months-long Arctic winter, propellers aft and for'ard, deck-space for helicopters and Austers, and snowmobiles for ship to shore work where ice is heavy or thick. Because

scientific outposts. Danish and Norwegian icebreakers, sealers and supply ships spent the short summer "forcing" the Greenland pack, taking supplies to trapping posts and scientific and meteorological stations; Norwegian ships sailed northwards to Spitzbergen; and the Soviet Union sent a veritable fleet of icebreakers up and down her Arctic shores, "breaking ice" for the merchant convoys that serve the new industrial cities sprung up in the Russian North since the war.

And when winter froze Far Northern seas beyond penetration, the icebreakers headed towards the Far South, where it is now high summer. They carry the flags of the United States, Australia, New Zealand,

France, Norway, Sweden, the U.S.S.R., Argentina, Chile—and Britain, six from Britain.

Why the sudden activity in polar seas? Transport developments since the war have made it possible to broach the natural wealth of Canada's Far North, Alaska, Greenland and the Soviet North, and of course when you develop new territory you have to

defend it—which means building military bases there and then maintaining them.

And the Far South? For one thing, just as once the nations grabbed so called useless areas of the Far North, now they are claiming huge slices of the Far South, which means setting up bases there—and supplying them through the grinding pack ice by sea. For another, the Geophysical Year is nearly upon us.

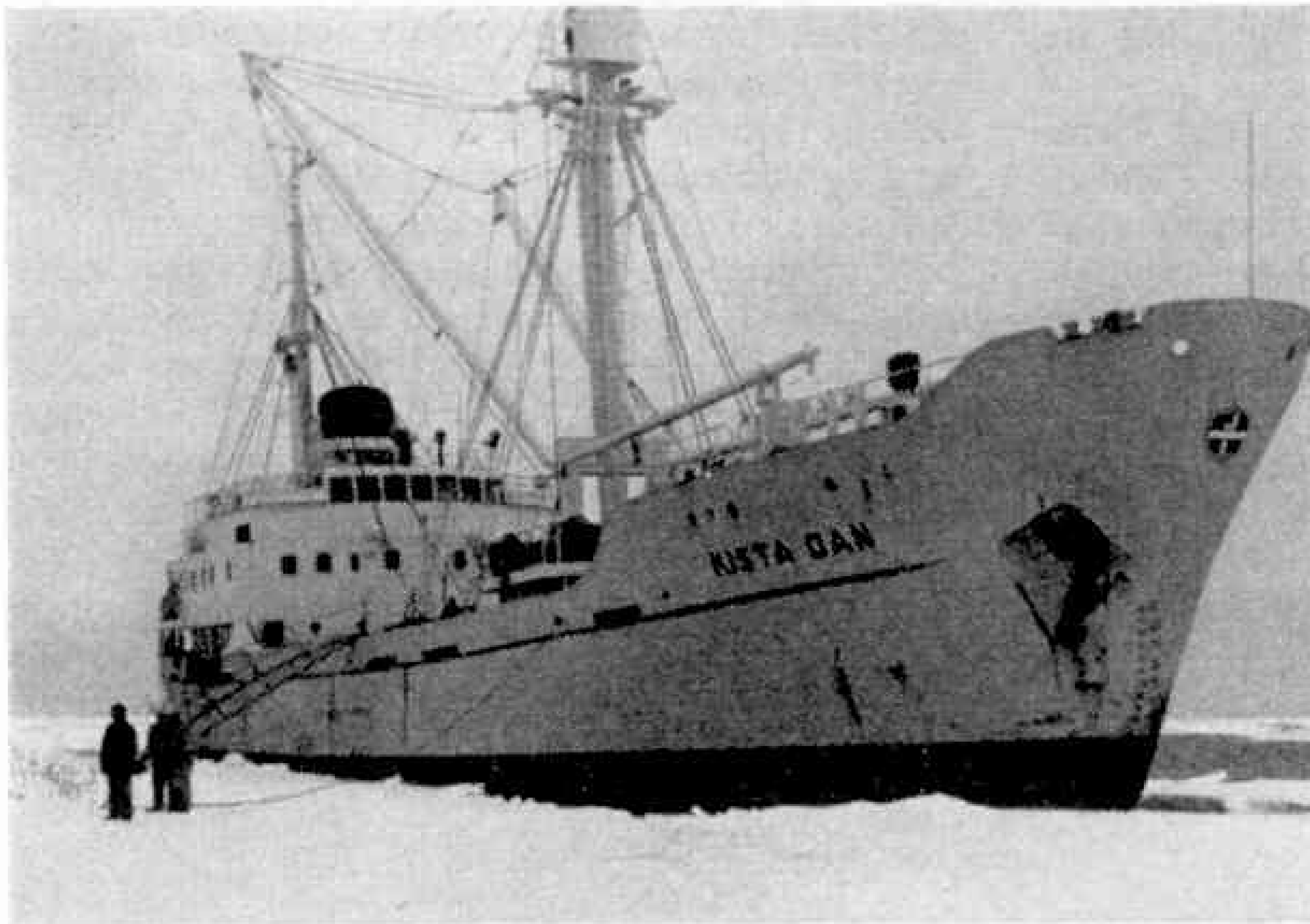
The International Geophysical Year 1957-58 is one of the biggest international scientific projects ever organised. The idea is for a world effort to study South Polar phenomena such as the Southern Lights, temperature ranges and ice-recession over



The helicopter deck is prominent in this picture of the R.C.N. Arctic patrol vessel "Labrador."

of the large number of searchlights, aerals and navigational appliances, the masts may be in tripod form for strength. And, beneath all this, engines sufficiently powerful to drive a 10,000 ton ship up on to an ice floe to crush it with her own weight—or to smash floes so that she can steam through them.

Never at any time were more icebreakers smashing their way through polar ice than last year. American and Canadian ships with the curved bows and the immensely powerful engines of the "polar boat" operated all summer in the ice-jammed waters of Arctic Canada, Alaska and Greenland, establishing new camps and



The "Kista Dan," which is now taking a major Australian expedition to the Far South, is here seen in Antarctic waters.

a period of seventeen months TO AN AGREED PLAN. All told some 47 scientific bases are to be set up in the Far South between now and July 1957, when the I.G.S. opens. Among them will be "the greatest single polar expedition since Scott's day," the Commonwealth Trans-Polar Expedition, the important expedition backed by the Royal Society—one of the most important scientific societies in the world—and an American expedition of more than 1,000 men. And each expedition will need an icebreaker supply ship to carry it to its base site away in the Far South.

The polar boats of

"John Biscoe," the famous polar vessel, charging the ice in Lemaire Channel, 25 miles from the British outpost on Argentina Island, off Graham Land, Antarctica.

today range from sealers like the *Norsel*, now on her way "south" with a French expedition, to Canada's powerful and armed H.M.C.S. *Labrador* and the U.S.N. *Northwind*, two of the most powerful icebreakers in the world.

Undoubtedly the most famous polar supply ship flying the British flag is the Royal Research Ship *John Biscoe*. A converted wartime netlayer, she invariably carries one 16-year old messboy (two this year), and she has featured in many

dramatic episodes in the grinding pack ice of the Far South, not least of which was her dash to the British base at Hope Bay, in Graham Land, in 1949, when the base hut was burnt down.

To quote the official report on her battle to reach Hope Bay: "With icebergs and icefloes from the south constantly moving on to the *Biscoe*, there was every possibility of her being caught in the pressure of the ice." She had to retreat, leaving the men at Hope Bay stranded on a frozen shore, and on her second attempt to win through she became so firmly wedged in by pack ice that her commander, Capt. Kirkwood, ordered the supplies in her store rooms to be rationed to last ten months. At last, however, she smashed through the Lemaire Channel to Hope Bay and got out with the Britons there.



As her commander said: "It was a near thing." And the *Biscoe* faced destruction in those same waters last year during her annual round of British Antarctic bases. She was, in fact, so badly pinched by ice that she had to be drydocked. Last year it was decided that her wooden hull would not stand much more battering by ice, and orders were placed for a brand new

icebreaker, complete with all the aids to navigation in polar waters.

What sea ice can do to a ship was illustrated last autumn, when the *Jopeter* was caught in the pack off Greenland's east coast, where the moving pack ice roars with grinding thunder. The *Jopeter* was to have taken the Royal Society's Antarctic Expedition to the Weddell Sea last November. Now this party has sailed in the Norwegian polar boat *Tottan*, for the *Jopeter* was crushed to death.

There have indeed been many developments in polar boat construction since the days when seamen preferred wooden to steel hulls for polar exploration, because of the "give" in wood.

Among the most interesting of these is the for'ard propeller. The main objects of for'ard, inward-turning propellers are to sweep aside broken pieces of ice and increase manoeuvrability. Their backwash carries broken ice away from the side of the ship and helps to prevent the ship becoming fast in the channel she has broken.

Icebreakers with fore and aft propellers have proved most useful in the Baltic, where winter ice is comparatively thin, and in some Canadian waters. The first icebreaking ship to have two forward propellers indeed was the Canadian *Abegweit*, built in 1947. But for'ard propellers are not practical for work in polar waters, where the ice may be fifteen feet thick or compressed into crashing floes piled 50 feet above the water. There are records of converging pack ice lifting a ship as much as 40 feet above the level of the sea.

For polar work the modern icebreaker relies on her powerful engines and a reinforced and curved bow. Powerful ships like Canada's *Labrador* will back time and again to charge a floe. Her twin engines drive her curved bows up on to the ice, which cracks either from the impact or under weight, whereupon she enlarges the crack and charges again.

Ships like *Labrador* and *C.D. Howe* have sailed as much as 10,000 miles in Canada's Arctic waters in a single summer. But

fortified for work in heavy ice as they are, even these powerful ships will take avoiding action when threatened by heavy pack, and resort to dynamiting the ice when it is too thick to split by charging.

The modern polar boat hull is not only reinforced. She is formed so that heavy ice will not pinch her, but force her up on to the floes forming around her so that when the current parts them she settles back into the water to resume her charging tactics.



The U.S. Navy coastguard icebreaker "Northwind" is one of the most powerful vessels of this kind in the world. She is seen here breaking her way through medium sea ice.

This hull "curve" is noticeable in photographs of, for example, *Labrador* and *Northwind*, and also *Kista Dan*, now taking an important Australian expedition to the Far South.

Two other advantages unknown to the early polar explorers are radar and helicopters. The larger polar boats have flight decks for helicopters, for ship-to-shore ferry work and to reconnoitre for channels through the pack. As for radar, if radar screens do not always show a level field of pack ice they will show hummocky surfaces and icebergs, and the Canadians have evolved a technique of locating channels in pack ice by interpreting the echoes displayed on radar screens.

But not even the most powerful and up-to-date polar boats can be certain of reaching their objectives in the Far South, for the Antarctic Continent is surrounded by ice 600 miles and more across—or of escaping from the grip of the pack if they do!



More Adventures with a Camera

By H. Gordon Tidey

CONSIDERABLE experience has convinced me that the Western Region, as we now know the old Great Western, is of greater interest to many enthusiasts than the other British Railways Regions. I decided after much cogitation to spend my annual week of railway photography in that Region, therefore, proposing to make my chief headquarters at Taunton.

Packing my impedimenta into the car, I set off from home and in the late afternoon duly arrived at Bruton, in Somerset.

I am still using my old and well tried 10 × 15 cm. Dekrollo Nettel fitted with the 8½ in. Cooke 4.5 lens. This camera, bought in 1920 has now seen no less than 35 years' service, extending from Aberdeen to Kingswear, and is still working as well as when new. I am

a firm believer in taking my pictures full size. Although this involves much heavier expense for plates, not to mention weight carried, it is a consideration when one realises that I often require a large number of postcards off one negative and to be able to print these direct by contact is far preferable to having to enlarge each individual one separately. Also, I still believe that one gets a better result than by making an enlargement from a small negative.

The size 10 × 15 cm. is of course approximately 6 in. × 4 in., which gives a ½ in. margin each side of a postcard. Plates of this size are not always readily obtainable at photographic dealers, but can be ordered in advance, so the essential point is to see that one is well stocked

before starting, when proceeding on a trip such as this. So I started off with 2 dozen full slides and an ample supply of replacements, plus a portable dark room lamp and a hope that I should be provided with a bedroom where there was neither a street lamp right outside, nor a badly fitting door with a fanlight and a light in the passage, so that I could change plates without risk. My luck fortunately held in these respects.

Bruton is served by the Western Region, and also by the line of the former Somerset and Dorset Joint Railway. I managed to

be present during an outsize thunderstorm that visited the district. I was then in the car, in the approach to Cole Station, which is situated in a dip, and the heaviest rain I ever experienced

descended upon me, and everything else. After half an hour, during which water came down the slope like a cataract, it was half way up to the hubs of the wheels, and I began to consider seriously whether I should be either afloat or submerged entirely, as there was no sign of clearing. But when the water had risen to the top of the rail level, things brightened up a bit, and as I had previously obtained a shot of the down *Pines* and one or two others, I splashed through the inundations to Bruton Station. There I obtained a snap of the local push and pull running between Taunton and Westbury, hauled by the 54xx class of large wheeled 0-6-0 Pannier Tanks specially built for this work.

During my four days stay at Taunton I paid another visit to Wellington and

The illustration at the head of the page shows the down Cornish Riviera Express climbing Wellington Bank. The locomotive is No. 6004 "King George III."

as it was on Saturday, I saw an incessant procession of trains, by far the greater number of which were labelled for Paignton and were hauled by engines of a number of classes among which Castles predominated, although there were also Kings, Halls, Manors, Granges and even Standard Class 7s, as well as Moguls. I also saw one 2-8-0 of Class 47xx on a Plymouth train. Goods traffic here on a Saturday is practically

A Western Region scene. No. 4948 "Northwich Hall" at the head of an up semi-fast train at Aller Junction.



non-existent, but in the late afternoon I did obtain a shot of a down goods hauled by a 2-8-0 of class 28xx, and as usual assisted in rear by a 2-6-2T.

On the Friday I had proceeded to Cullompton, which I mentioned as having discovered on my previous visit two years ago. Here I spent a very interesting day, getting quite a number of shots of down trains of all classes, and I was again able to note the prevalence of Castle, which are undoubtedly the mainstay of the Region, although many important fast trains are worked by Halls, which are capable of high speeds in spite of their small wheels.



Leaving Taunton early next day, I arrived at Newton Abbot just in time to get a shot of the up *Torbay*, which passes at 12.15 and for a change was hauled by a Standard Class 7. On the Monday I obtained a few shots early, after which it

set in for a real West of England wet day, which was still in full operation at 11 p.m., so—no photography.

On Tuesday morning I left early and reached Wincanton in time to obtain a shot of the late S. and D. J. *Pines* and several others. Wishing to find a spot outside the town, I proceeded along a road parallel to the line for some distance, turning off down a by-road towards the line. There I came face to face with a decrepit and rusty tricycle, and on further inspection I found it to be propelled by what might well have been the oldest inhabitant of the adjacent village. Despite the temperature, which approached the 80s, he was clothed in a thick fustian suit, and had a heavy woollen scarf around his neck, from which I assumed he was determined to be prepared for an English summer!

I accosted him. "Excuse me, will this lead me down to the railway?" After repeating this three times, each time louder, he replied "There ain't no

Down Western Region goods near Wylie.

station down 'ere—you must go back and turn left, and then second right." Here I interrupted. "I don't want to go by train, I want to get on the line." After some cogitation this produced the reply. "You can't do that there, that's a trespassin' I remember my grandfather...." Here I interrupted again and said. "I want to take photographs, and have permission." After more cogitation he told me what to do. "If you want to take photographs, you should go to the village. All of 'em takes that there thatched cottage by the stream."

I gave it up and moved on, leaving him still discoursing. In a short time I reached the line, and after negotiating a fence without barbs, and therefore harmless to trousers, I found myself on the embankment of a shallow cutting, with the advantage of an adjacent overbridge, always a valuable adjunct to the making of a

occasionally sees a Class 3 or 4 standard, but these are rare and usually on specials, piloted by a class 4 goods or a 4-4-0 of class 2 when the load is substantial. There are also a few "Black Fives" in evidence, and late Midland Class 3 goods, which appear to work the branch from Evercreech Junction only.

While at Cole I was fortunate enough to get a shot of one of the late S. and D.J. 2-8-0 goods. This had been left to ruminate in the yard on its own, apparently while the crew had gone to lunch, and afforded a fine opportunity. These engines, which have now seen many years service, appear to be most useful. Although used mostly for goods traffic, of which the line has a fair share largely because of the colliery at Radstock, they also take their turns on passenger trains in the summer season, no doubt owing to shortage, as they are quite unsuitable for such duty.



A Liverpool-Kingswear train on Wellington Bank. The engines are Nos. 5172 and 73026.

picture. In addition, signals in both directions gave warning of approaching trains, and thus avoided the tedious process of waiting for indeterminate periods, and then finding oneself all set for one direction, whereas the train comes from the other.

I obtained yet another shot of the *Pines*, and several goods and locals, and was interested to see that at least one of the late Midland 0-4-4 tanks was in operation on the latter service. I had previously obtained one of a *Jinty* working a local passenger train through Cole, but when on this line last year, during a whole week, I did not see one of this class, the locals being worked either by Class 4 goods, or 4-4-0's of class 2, the Jinties being exclusively on pusher service up the formidable banks. The S.R. West Countries, which for some time worked the principal expresses, have now all been replaced by Standard Class 5s. One

One is inclined to wonder how such shortage arises, considering the vast fleet of engines of all classes owned by the late Midland, who provide the bulk of the motive power. In the course of travelling, one sees so many standing idle, and wonders why these cannot be co-opted into service, instead of eating their heads off in idleness.

My week's trip had now come to an end. I had been favoured with a considerable amount of sunshine, but had also experienced the worst storm I have ever encountered, with one wet evening and a whole wet day. Last, but not least, I had acquired a number of fine shots.

It must be remembered that on such a trip one has to take everything on chance. Should the camera fail in any respect, the whole week's work could easily be completely spoilt. I have considered developing trial plates during the tour, but that would entail too many difficulties.

Air News

By John W. R. Taylor

Vickers Vanguard Announced

The Vickers-Rolls-Royce-B.E.A. partnership that put the Viscount air liner on the international air routes looks like producing another world-beater by 1959. In that year, B.E.A. will receive the first of its recently-ordered fleet of Vickers Vanguards, and if present estimates prove accurate, they will introduce



A comparison of size. These Vickers models show (top to bottom): the V.900 Vanguard; Series V.800 Viscount Major, and Series V.700 Viscount.

completely new standards of comfort, performance and economy over all distances from 200 to 2,500 miles.

The Vanguard will be powered by four Rolls-Royce R.B.109 Tyne turboprops, which will be limited at first to 4,000 h.p. each, giving a cruising speed of 400 m.p.h. Later, the power will probably increase to 4,150 h.p. each, raising the cruising speed to 425 m.p.h. In its B.E.A. form, the aircraft will carry 93 passengers, plus a heavy load of luggage and freight, and will make money even when only 30 of its seats are filled.

According to B.E.A., the figure-8 section fuselage is the largest yet ordered into production for any civil air liner. The top deck will include three separate cabins and two galleys, and on the lower deck there will be

two luggage and cargo holds, with very large freight doors in each.

The Vanguard will not replace the Dart-engined Viscount, being intended for service over longer ranges or where there are so many passengers on a short route that a large aircraft can easily be filled, as on the London-Paris service. In fact, B.E.A. announced, at the same time as their Vanguard order, that they have ordered also a fleet of V.806 Viscount-Majors to supplement the 22 V.802s which they will begin to receive this year. Cruising speed of the V.806 will be 360 m.p.h. and Vickers expect the Dart to develop so much power in time that a 400 m.p.h. Viscount will be possible.

Swedish "Double Delta" Fighter

As expected, the Swedish Saab company have produced a new fighter aircraft with the unique "double delta" type of wing that they have been flight testing for nearly four years on the little Saab-210 research aircraft.

The fighter, which is designated the Saab-35, made its first flight on 25th October last, and has already been ordered into production for the Royal Swedish Air Force as the J-35 *Draken* (Dragon). It appears to be almost identical in shape with the Saab-210, but bigger, and is powered by a Rolls-Royce Avon turbojet, with afterburner.

The Saab-35 is expected to fly considerably above the speed of sound in level flight, and has been designed to carry rockets and air-to-air guided missiles in addition to its fixed cannons. It will, in due course, replace the Saab-29 "Flying Barrels" which equip most R.S.A.F. day fighter squadrons, and is fitted with radar equipment

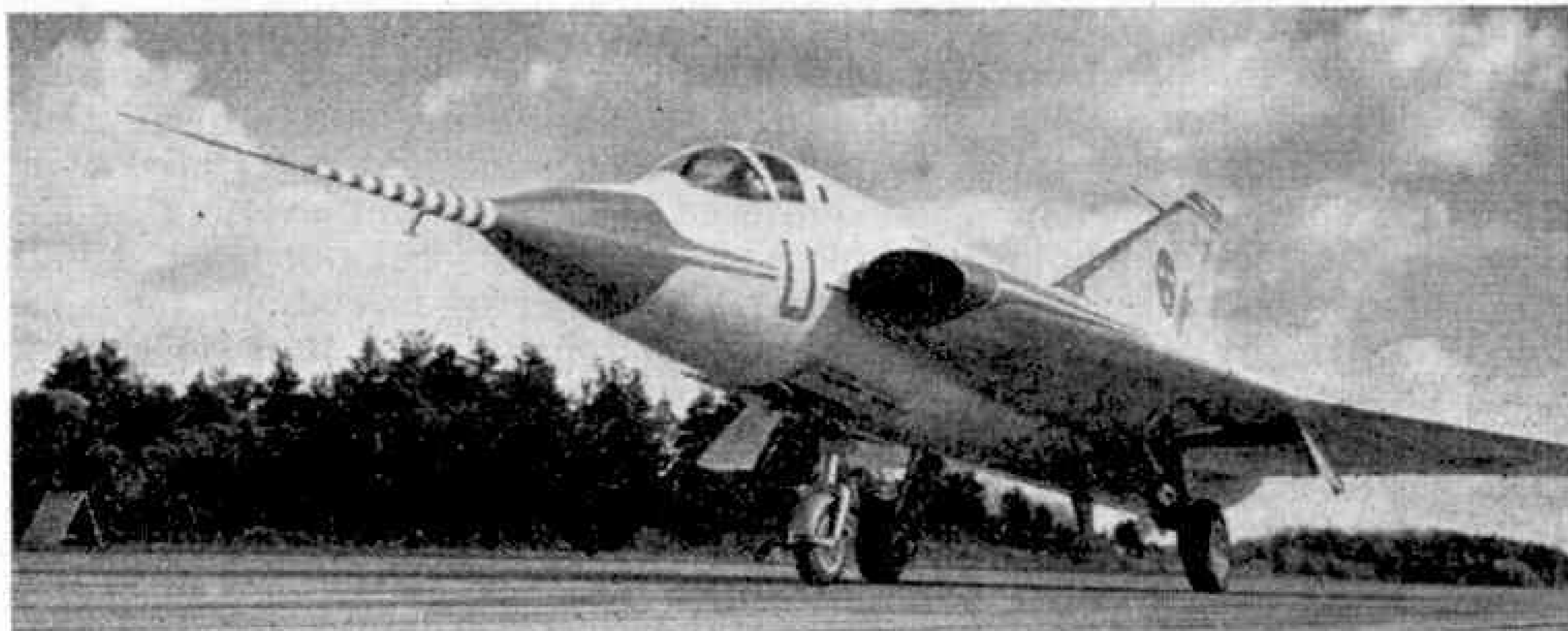
for all-weather navigation and fighting at very high altitudes.

10,000 Crossings of Stormiest Sea

On 28th October last, Tasman Empire Airways made their 10,000th crossing of the Tasman Sea, which is noted for its stormy weather conditions. The flight was made by the DC-6 air liner *Aotearoa* in five hours, carrying a crew of seven and over 50 passengers.

The first successful crossing was made in 1928 by Sir Charles Kingsford Smith and Charles Ulm in their famous Fokker monoplane *Southern Cross*. They took 14 hr. 25 min. for the 1,502-mile journey.

Seven years later, Kingsford Smith was flying a load



The Swedish Saab-35 "Draken" fighter, a distinctive feature of which is its "Double Delta" type of wings.



The Folland Gnat lightweight fighter, showing the inboard ailerons with which it is equipped. Photograph by Cyril Peckham.

of King George V Jubilee mail across the sea when the aircraft developed serious engine trouble. At once his co-pilot, Gordon (now Sir Gordon) Taylor, took off his shoes, clambered through a window on to the oil-covered wing bracing struts and drained oil from one of the three engines, which had gone dead, into a thermos flask. He then climbed back into the cabin and out on the other side, where he transferred the oil to another engine, which was failing. He did this again and again, and his courage saved the aircraft, but not the mail, most of which had to be thrown overboard into the sea to reduce the load.

The Gnat's Ailerons

The Folland Gnat lightweight fighter has resumed its flight tests, fitted with aileron boosters of a new type, to relieve the pilot of much of the effort of moving these controls at high speeds. Folland will give no details of the boosters until their success has been proved; but the ailerons of this little fighter are interesting in themselves even if we forget the boosters.

To start with, they are fitted on the inboard section of each wing, close to the fuselage, instead of in the usual position near the tip. And they are linked to the undercarriage in such a way that, when the wheels are lowered for landing, the ailerons both droop downwards and serve as flaps, to steepen the angle and reduce the speed of the landing approach. They continue to work also as normal ailerons and, in fact, give excellent control at low speeds.

"Lone Ranger" Canberras

To ensure that they could do their job in the worst possible conditions in wartime, the two-man crews of photo-reconnaissance Canberras of No. 69 Squadron, of R.A.F. Bomber Command, based in Germany, were sent to the Middle East this summer to carry out "lone ranger" sorties.

While the Canberras were based at Malta, Idris in Libya and El Adem in Cyrenaica, the crews had to do all the first-line servicing of the aircraft before and after flight, and load and unload their own photographic film. The aircraft went out on their sorties singly, the idea being to get in as many reconnaissance flights as possible in a 48-hour period.

Just the Ticket!

We always wondered what went into the neat zip-fastened overnight bags that some airlines give to passengers who fly on their long-distance routes. Now we have a clue, because it has been revealed that a ticket issued recently by Air France to a travelling salesman weighed no less than three pounds.

Apparently this passenger planned to make a seven month's tour of Africa and Madagascar, involving 25,000 miles of travel. Each of the 47 separate stages of his trip had to be entered on a separate coupon in the ticket, which would have been about five yards long if the coupons were joined end to end.

Although only 35 Heralds have so far been ordered, Handley Page are so confident of the future of this new

36-44 seat maid-of-all-work transport that they are laying down the jigs and tools for an initial production batch of 100.

The last four D.H. Tiger Moth trainers, out of a total of 5,145 delivered to the R.A.F. since 1930, have been grounded and are being sold, like hundreds of others, to private owners and clubs.

To Fly 100 Miles Up

As a further stage in the joint U.S.A.F./U.S. Navy/N.A.C.A. research programme, North American Aviation have been awarded a contract to build a rocket-powered piloted aircraft for exploratory flying at heights above 100 miles (528,000 ft.). Previous aircraft built under this programme include the Bell X-1 which achieved the first faster-than-sound flight in 1947, the X-1A which has reached 1,650 m.p.h. and a height of 90,000 ft., and the X-2 which is preparing to probe the heat barrier at speeds over 2,000 m.p.h.



A fine new picture of a production Vickers Valiant, the first of the three "V" Class atom-bombers to enter squadron service with R.A.F. Bomber Command.

Power from Lightning

By Arthur Nettleton

ONE of tomorrow's miracles may be the harnessing of the immense electrical energy of lightning. Meteorologists state that every moment at least 1,000 thunderstorms are in progress in different parts of the world, and that some 100,000,000 kilowatts of electricity flash through the heavens every second.

Yet, at the present time, all that colossal energy goes to waste. If only a fraction of it could be trapped and stored, to be released as required, whole towns could be supplied with free current for lighting homes and running factories.

So far, no way of storing large quantities of electricity has been found, but that does not mean that the problem is being ignored or that it will never be solved. Alongside research in that direction, scientists and meteorologists are investigating the phenomena of lightning.

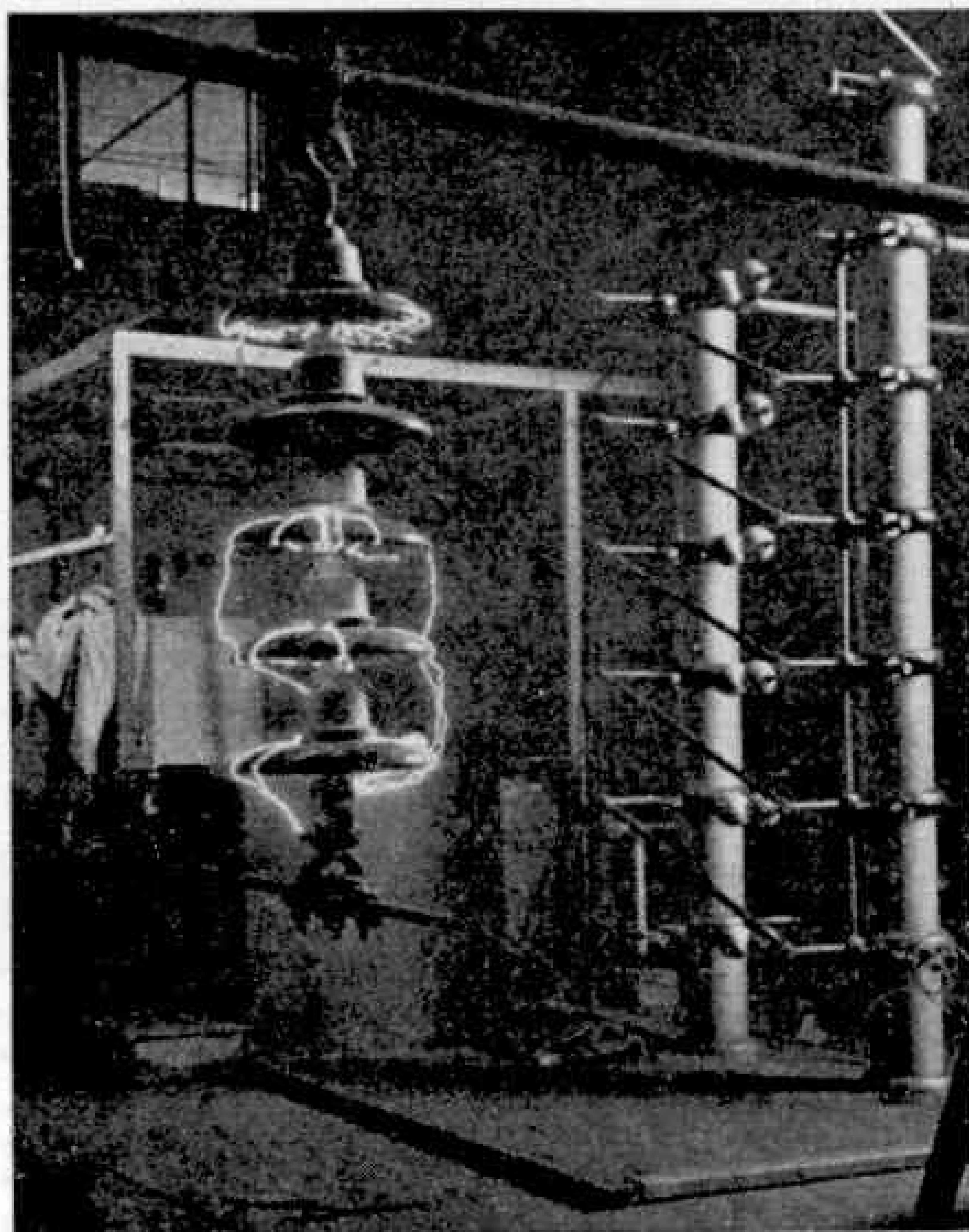
In point of fact, we know a good deal more about such freak weather today than we did only a few years ago. Our knowledge of the causes, routes, and effects of thunderstorms has been considerably extended. Much of this new information will be helpful in future efforts to obtain free electricity from the skies.

Weather experts report that in Great Britain we experience more thunderstorms than most people realise. Although the period June-September is rightly regarded as the season for them, there is scarcely a day in the year without a thunderstorm somewhere over the United Kingdom. This means that if we could "collect" the lightning we should have plenty of flashes available, even in winter.

Further, we are now able to test theories about the uses of lightning by experimenting with laboratory-made flashes discharging more than 5,000,000 volts. Such huge man-made lightning flashes are

Does lightning ever strike twice in the same place? The answer is yes. The Empire State Building, New York, seen in the picture opposite, was hit 45 times in a single year.

The picture at the head of the page shows man-made lightning flashes of 700,000 volts being passed across insulators to test them and determine the resistance they would put up against the effects of real lightning flashes. The tests illustrated are being carried out at the Queen Mary College of the University of London.



being produced to test the resistances of various types of high voltage electrical equipment, but the research will also be helpful in the wider question of utilising thunderstorms in our everyday life.

Several countries now run bureaux where data about such weather is gathered, tabulated, and studied. In Britain there is the Thunderstorm Census Organisation, with headquarters at Huddersfield, and 3,000 voluntary observers all over the country are assisting in the work.

They include farmers, foresters, country clergymen, rural postmen, school teachers, and many others who have good opportunities for studying the heavens. They note the place, time, and duration of thunderstorms, and the directions in which they pass over or near their locality.

They also count the flashes, record changes in air temperature, and collect details of any damage caused by the storm. This enterprise was begun as a hobby thirty years ago, but it is now so useful that it is officially recognised by the Meteorological Office and other bodies concerned with freak weather.

The reports which arrive at Huddersfield after each outbreak enable the route of the storm to be plotted on large-scale maps, and all the other information is tabulated. The findings have been invaluable to electrical engineers planning new overhead power lines, and are now widely used by insurance companies in assessing thunderstorm risks and investigating claims for damage.

Bogus or unjustified claims have been exposed by the reports of thunderstorm observers. Investigators have studied the charts to ascertain whether the storm alleged to have caused the damage did in fact pass close enough to do so.

Some old ideas about thunder and lightning have also been disproved in recent years. For instance, the recorded observations show that, contrary to a

near these danger spots, thus minimising the likelihood of power failures being caused by lightning.

It has also been found that while certain kinds of tree are struck more often than others, this is because there are more of them, and not because they attract lightning. Thus, in England more oaks are hit than any other kind of tree—but the number struck is almost exactly in accordance with the proportion of oaks in the total number of trees of the country.

There is an important exception to this rule. It is provided by smooth-barked trees. They suffer from lightning rather less than other kinds, because when the trunk becomes wet, as it usually does in a thunderstorm, it acts as a lightning conductor. But it is really unwise to shelter under *any* tree in a thunderstorm.

Another common misconception is that thunder travels at a speed of one mile per second. Its actual rate of progress is about *five* seconds per mile, so to determine the nearness of a thunderstorm you must allow five seconds interval between the flash and the clap of thunder to represent one mile. Ten seconds interval means that the centre of the storm is two miles away, and so on.

If the wizards of the electrical engineering world do manage to harness lightning, they will want to find the most thundery places on the globe. Such places will probably be discovered in Central and South Africa, Southern Mexico, and Central Brazil.

But there are still some mysteries to be solved. For example, why does lightning often strike African natives while they are running for shelter, while it seldom harms those who walk to a place of cover? Why is a certain stretch of England, running south-west for 50 miles from the Wash, almost free from thunderstorms? These questions have still to be answered.

Again, we have much to learn about the freak effects of lightning. A considerable number of people have been struck, but have escaped serious injury. A flash tore the metal buttons from the uniform of a Brazilian army officer, yet he was unharmed.

Two London children were knitting when the metal needles in their hands were melted by a flash of lightning, but the youngsters suffered no burns. A boy launching a model yacht on a lake saw the ship vanish in smoke as a flash streaked from the sky, but he was unscathed.

(Continued on page 58)



widespread belief, lightning does strike twice in the same place. Indeed, some elevated spots and tall buildings are struck repeatedly. In one year the Empire State Building, New York, has been hit no fewer than 45 times! Some elevated points of the world's surfaces have a similarly unenviable record.

By studying the figures, electrical engineers are now able in many cases to avoid routes that would take power lines

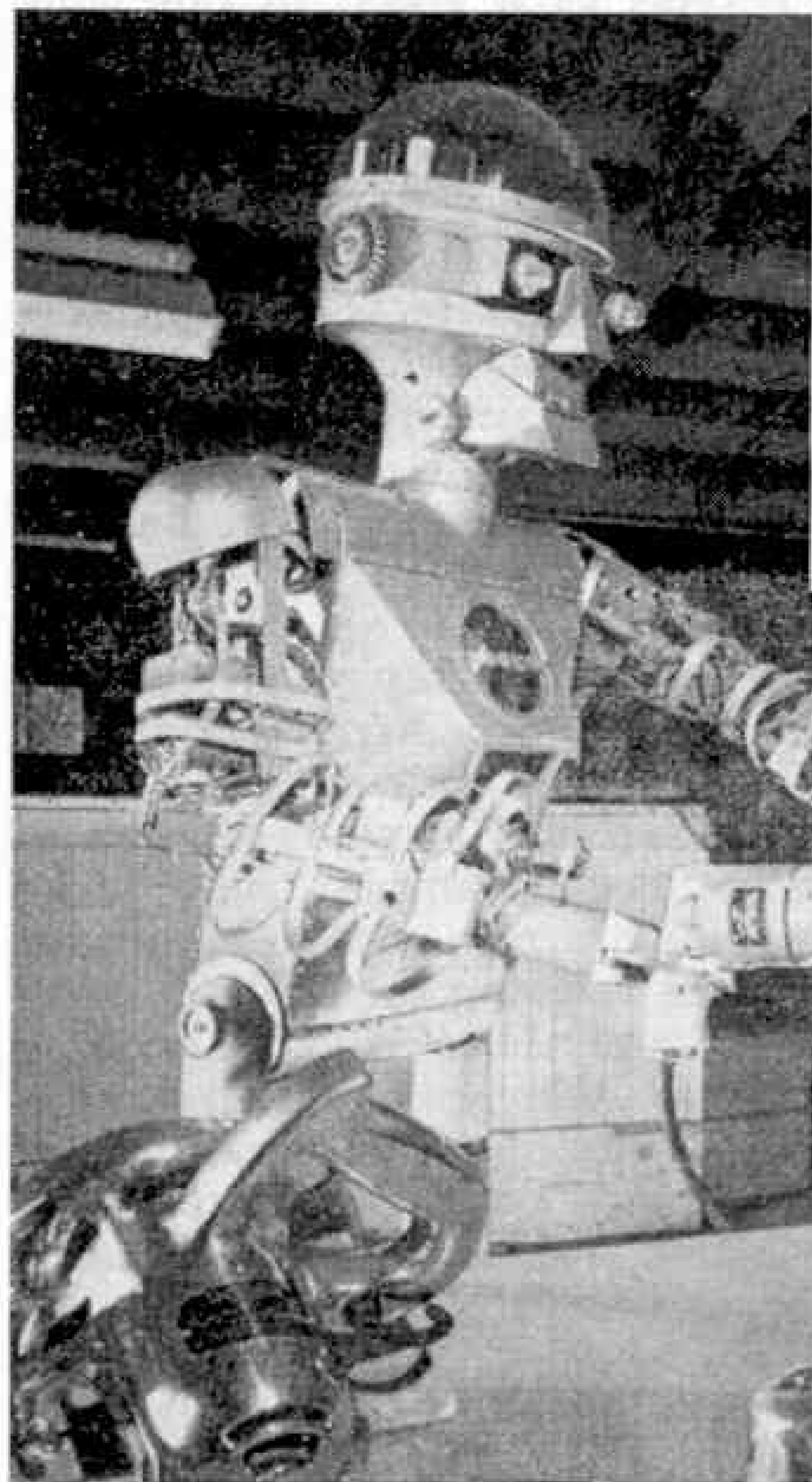
Garco

By Michael Lorant

Garco is a remarkable creation, built up of electronic devices designed for controlling the speed, altitude and acceleration in turns of aircraft and for similar purposes. This article explains some of the strange things that he can be made to do.

IN America the Garrett Corporation has recently designed and built a mechanical man who is claimed to be second to none all the world over. His name is Garco and he is used by the AiResearch Manufacturing Company, a division of the Garrett Corporation, to demonstrate gears, motors, and other products.

The five-and-one-half foot robot was



Garco active in his workshop. In this picture he is wielding an electric hand drill to bore holes in a plate, and is obviously concentrating on his work.

actually created by Harvey Chapman, a skilled engineer of the Garrett Corporation. Chapman salvaged electric and electronic test equipment for use in building his mechanical man, who weighs 250 lb. and is mounted on a pedestal fitted to rotate through a right angle. With the exception of the gears, all of the equipment contained in the robot is produced by the AiResearch manufacturing division.

The brain of the robot is a modified

temperature regulator system, which operates his right arm through an electronically controlled servo-mechanism. His left arm is mechanically controlled by push-buttons from a master control panel. Each arm contains five actuators, which simulate the action of a human arm at the shoulder, elbow and wrist-joint.

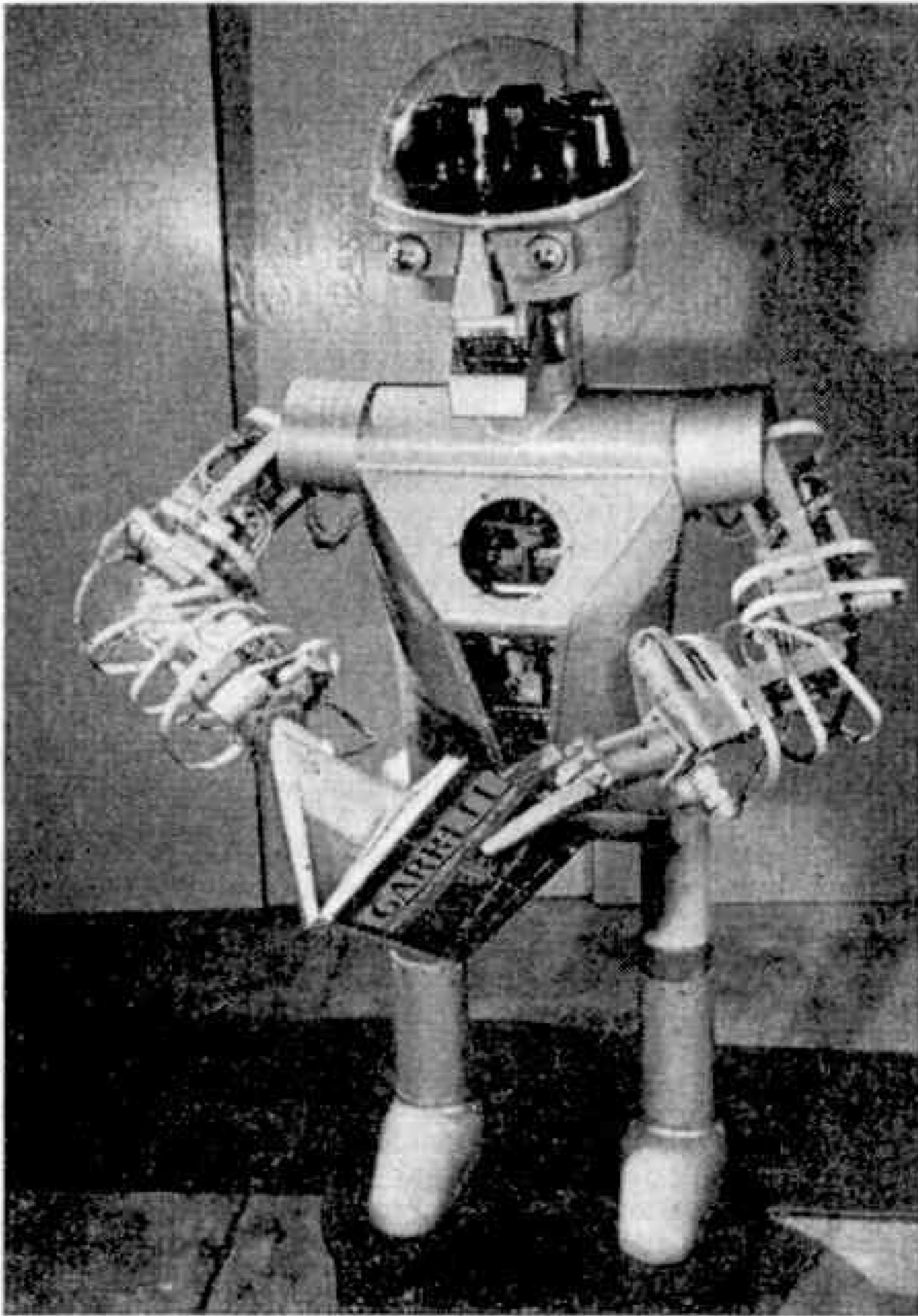
A central power system is located in his chest to operate the synchro-drive mechanism that enables Garco to bend forward and back from a normal upright position.

A total of 60 wire leads and nearly a quarter-mile of wire make all electrical and electronic contacts in the robot and hook him to the main control panel several feet away.

Actuator jacks in his legs allow Garco to "grow" six inches or to reduce his height by the same amount. Other mechanisms that make him appear almost human are *solenoids* to move his jaw and hip, *step motors* to rotate his eyes, and a *two-way transmitter* to give a human voice. His electronic brain is a basic servo system multiplying six times. Six channels include peanut sized potted two-stage amplification units (one for each channel).

The American Garrett Corporation, owner of "Garco," is in the business of building robots for the world's aircraft. Some of these control the air temperature and air pressures in the cabin of a plane for the

comfort of the passengers. Others record the aircraft's airspeed, altitude, and acceleration in turns so that the guns of a fighter plane may be kept on target. These duties are all carried out automatically. In shooting at a moving target you do not actually aim at the target when you fire, but at the point where it will be when your bullet arrives. This takes a lot of figuring which a human could not do in a short time, but an



Garco makes some astonishing discoveries about himself! The book he is "reading" is one describing what he is made of and how he works.

electronic robot can do it in less than a second. These robots do not have all the features of Garco, but they do even more spectacular jobs. They cost from a few pennies to a million dollars.

Modern aircraft fly at such speeds and altitudes, and they are so complicated, that a human being does not have enough hands or enough time to react quickly enough to take care of all the things necessary to fly them properly. Dozens of robots now do these jobs. In some cases, a robot even flies and navigates the airplane—the pilot is only a passenger, or acts only as an observer. In some cases, the human observer has been eliminated. Guided missiles today are pilotless aircraft robots that do as directed by human beings, and once the missile is on its way it is on its own as it seeks out an enemy airplane to destroy.

It is not only in aircraft that these remarkable devices are used. Many oil refineries nowadays also have been almost entirely "robotized," and men are only employed to keep all the robots running properly. Robots, like humans, need a doctor occasionally.

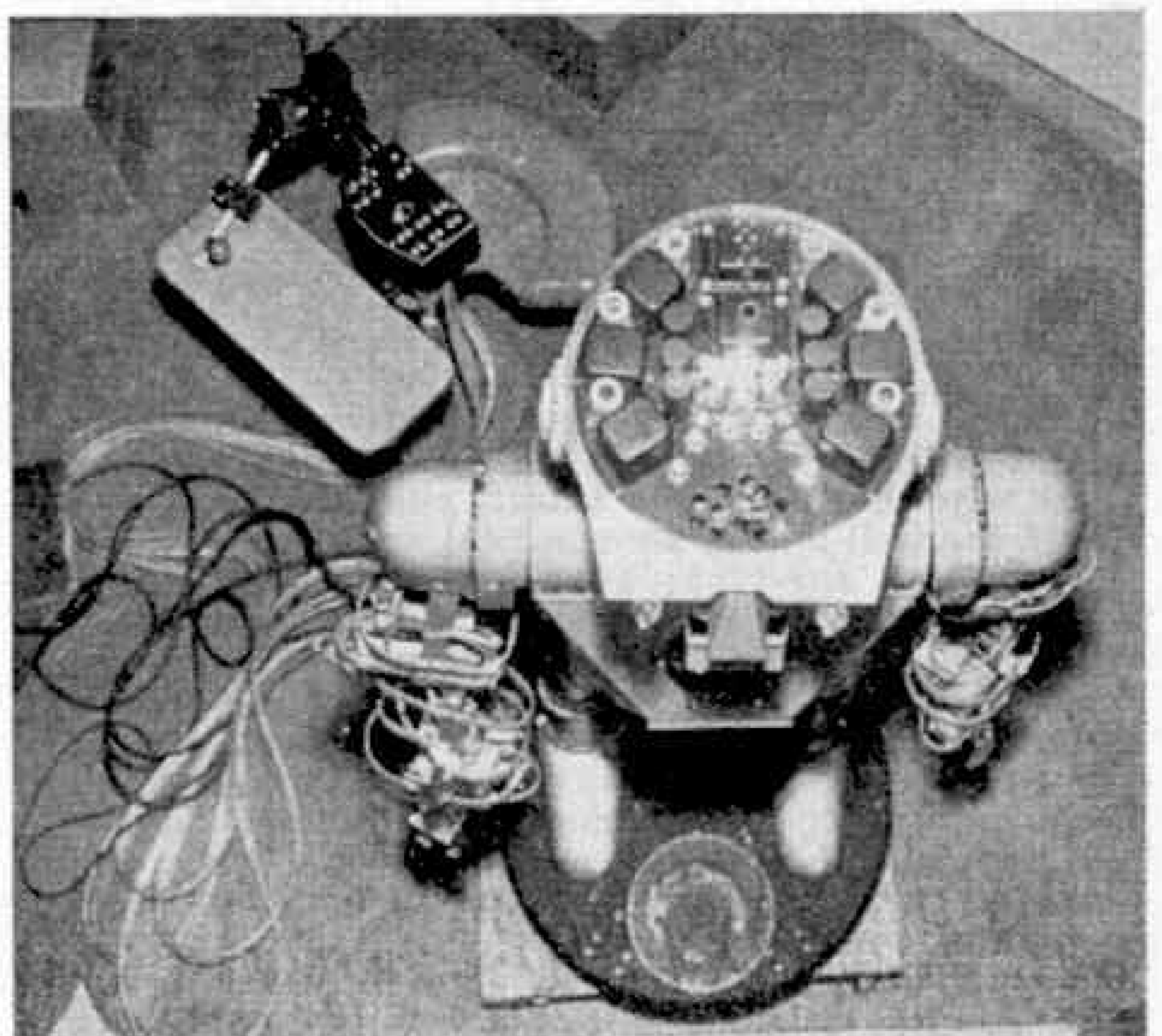
Some canning factories feed raw can materials, such as cardboard or tin, into an automatic machine. They are formed into containers, filled with food, sealed, labelled and deposited at the other end, neatly packed in a sealed cardboard box, all without being touched by human hands.

The brain of Garco is the same electronic system that controls the temperature of an aircraft cabin. The actuators in his arm open valves and move controls for the human pilot, and his lung controls the air pressure and ventilation of an aircraft cabin so that a human being may exist in the extremes of our present near space flight.

Because of this, the first pilot to the Moon, or to outer space, will be a robot. Many dangers lurk out in space, more destructive than those in the deep jungles of Africa. The water vapour that surrounds our Earth keeps the Sun's heat from making us look like burnt toast. The oxygen in the air allows us to breathe properly, but this same oxygen burns the flying pieces of rock from outer space that we call meteoroids before they can hit us.

Gravity plays another important part in our well-being. It would be very difficult to drink water if the gravity of our Earth did not pull it down our throats. Our legs and arms would not hang down from our bodies. We could not walk, as we could not apply a force to objects about us to push ourselves along.

Special means would have to be devised to overcome these and other difficulties, and electronic devices of all kinds will help to solve the many problems they present to us.



A peep into Garco's brain.

BOOKS TO READ

Here we review books of interest and of use to readers of the M.M. With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"INSTRUCTIONS TO YOUNG FOOTBALLERS"

By TOM FINNEY
(Museum Press, 9/6)

The title of Tom Finney's book, one of the volumes of the Brompton Library, sounds a little forbidding, but it is lively and full of interest. The author is well-known as a player of the highest class, and here he shows himself not only familiar with every feature of the game, but capable also of passing on to youngsters some of his own ideas and those of other masters. Every aspect of the game is covered for the reader, who learns easily how to train, how to play the ball, and, most important of all, how to play *in a team*, for it is team work that brings results. A mere glance through the book is sufficient to show this, for it includes many excellent diagrams of combined movements on the field that have brought success in actual games.

With all this there are many stories of the ways in which great players have distinguished themselves, and altogether it is difficult to imagine a more useful guide to all boys who play football and wish to do so intelligently and really well.

"TRAINS ANNUAL"

(Ian Allan, 9/6)

Once again we welcome the appearance of this popular Annual, which has become virtually a "must" for railway enthusiasts. The Editor, Mr. Cecil J. Allen, and his team of writers present plenty of very readable railway material and a fine collection of well-produced illustrations. Norman McKillop writes authoritatively on "the Gresley touch" from the footplateman's point of view, which gives the book a good start. Subsequent chapters tell the story of the *Royal Scot* and take us along the Welsh border, and we make visits to the railway wonders of Switzerland, Norway, and Australia, a description of the famous Trans-Australian Railway across the Nullarbor Plain providing a remarkable contrast to other articles in the Annual.

It is pleasing too, to find an interesting and well illustrated account of the Metropolitan Railway, its development, services and equipment. Steam locomotive subjects occupy two further interesting chapters, one dealing with locomotive running work and the other describing various British engines of each of which only one particular example has existed. The constant fascination of speed is given due recognition under the heading "*The Fastest Train on Earth*," and the book is rounded off by some well-told reminiscences of a military Railway Traffic Officer from the pen of Mr. D. S. M. Barrie, M.B.E.

The volume is well illustrated, with pictures in colour as well as in black and white.

"FLIGHT FLY-PAST"

(Iliffe)

Readers who collect photographs of aircraft will be delighted by this portfolio of aircraft photographs. These were taken by John Yoxall, chief cameraman of *Flight*, the well-known aeronautical weekly, and L. W. McLaren, his assistant. There are 24 of them, each measuring 11½" x 9¼", and they are beautifully reproduced on high quality art paper.

The aircraft portrayed include fighters, bombers and reconnaissance, air-sea rescue, transport, trainer and research types, ranging from the little Folland Midge to the big D.H. Comet and Bristol Britannia air liners. All the pictures were taken in the air, and there are some remarkable "shots" of both formation flying and individual aircraft.

This book can be ordered from any bookseller, price 7/6 or obtained direct from the publishers, Iliffe and Sons Ltd., Book Department, Dorset House, Stamford St., London S.E.1., price 8/4, inc. postage.

"LOCOMOTIVES OF BRITISH RAILWAYS"

(L.M.S. Group)

By H. C. CASSERLEY and L. L. ASHER
(Andrew Dakers, 8/6)

Both these authors are well-known in railway circles, and railway photographs by Mr. Casserley will be familiar to M.M. readers. Their book is the first of a series of four volumes intended to illustrate all classes of steam locomotives that have been owned by British Railways since nationalisation took effect in January 1948. For easy reference these classes are dealt with in the order of British Railways numbering, apart from slight variations to bring similar types together. As is almost bound to happen in a record of this kind, the quality of the illustrations is somewhat variable, but the engines in their various guises are all there.

As a prefix to the illustrations there is a class list giving brief historical data, with direct reference to the illustrations concerned.

"AEROMODELLER ANNUAL, 1955-56"

(Model Aeronautical Press, 10/-)

The latest edition of this now firmly-established Annual follows the lines of previous issues, and a vast amount of information for model aircraft enthusiasts is crowded into its 160 pages. There are the usual special articles on various aspects of the hobby, dealing this time with such subjects as Combat, the new control line sport; Power models without pylons; Slots and Flaps; some Rotors seen in Britain; and the development of a successful radio control model in New Zealand. A Netherlands enthusiast writes about the new A/1 class of Sailplane, and P. E. Norman, the great expert on scale models, tells the story of his innumerable ducted fan jet models. Current types of power units for model aircraft are illustrated, and brief specifications given.

There are lists of the winners of the various 1955 international model aircraft contests, and as usual the book contains plans of a variety of model aircraft. As in past issues, many excellent half-tone illustrations of aeromodellers "on the job" are included.

"TRAINS DIARY 1956"

(Ian Allan, 3/6)

Trains Diary 1956 includes a wealth of facts and figures of railway interest, in addition to presenting all the usual features of a diary. The British Standard Headlamp Code, types of Signals and the Signal Box bell code are featured, with many other items concerning stations, bridges, viaducts and so on. There are two diagrams of London Transport lines, one showing specially the connections with various London main line stations and therefore of special interest for station visits.

Altogether the diary is a handy and useful companion for the railway enthusiast.

"AIRCRAFT BADGES AND MARKINGS"

Compiled by HAROLD B. PEREIRA
(Adlard Coles, 5/-)

Aeromodellers who like to "finish off" their miniature aircraft by adding the national markings or registration letters of a particular country or airline will welcome this handy little book. It illustrates in colour the national markings and fin flashes and the airline badges adopted throughout the world. There is a list of the registration code letters of the various countries, with a more detailed list in respect of the countries forming the British Commonwealth of Nations. A very interesting chapter on "Aircraft Badges and Markings" relates the origin of these insignia and explains their significance.

MECCANO MAGAZINE

Junior Section

WEATHER BOYS

HOW much notice do you take of the weather? I suppose that most of you don't worry too much about it. You know what a mixture we can get, and are prepared to take the rough with the smooth. There is of course much more in weather than that, and the interest that is taken in the television and radio forecasts is proof of it, while farmers, sailors and airmen and others with outdoor occupations must know if possible what is ahead of them, in order that they can plan their proceedings.

Actually weather forecasting is a very interesting subject, and the experts go to a very great deal of trouble to get all the information they want to enable them to tell us what the weather is going to be like for a day or so ahead. They even have weather ships stationed far out in the Atlantic, sending back information by radio at regular intervals.

All this leads to the picture at the foot



No wonder Richard Moon is happy, for his striking fancy dress, designed for last year's Carnival Week in Skegness, Lincs., attracted enthusiastic notice from onlookers.



Measuring rainfall in the weather station at St. Crispins Secondary Modern School, Wokingham, Berks.

of the page, which shows two boys measuring rainfall. They are pupils of St. Crispins Secondary Modern School, Wokingham, Berkshire, which has the distinction of being an auxiliary station of the Air Ministry. The boys measure temperature, rainfall, wind speed and so on, and most of their equipment has actually been made by them in the school handicraft workshops. This equipment has some very interesting features, including a miniature Skylon, which will be described and illustrated in next month's *M.M.*

On the Right Lines

By "Tommy Dodd"

ARE you one of the newcomers to the fun of running Hornby Trains? Many of these join us at this time of the year, and I hope you will find your new hobby as exciting and interesting as do those who are already readers of these special articles, which are intended to help you to get as much pleasure as possible from your railways.

This month I want to talk about several things in a more or less general way. Before anyone starts train running he must have a good level railway, so you should look carefully to the connections of the rails, as described in the leaflet *Hints on Running your Hornby Railway* packed in every Hornby Train Set. Free running and good performance will follow if you do this, and if the engine and its vehicles are properly oiled. Here again the instruction leaflet I have mentioned will tell you really all that you need to know.

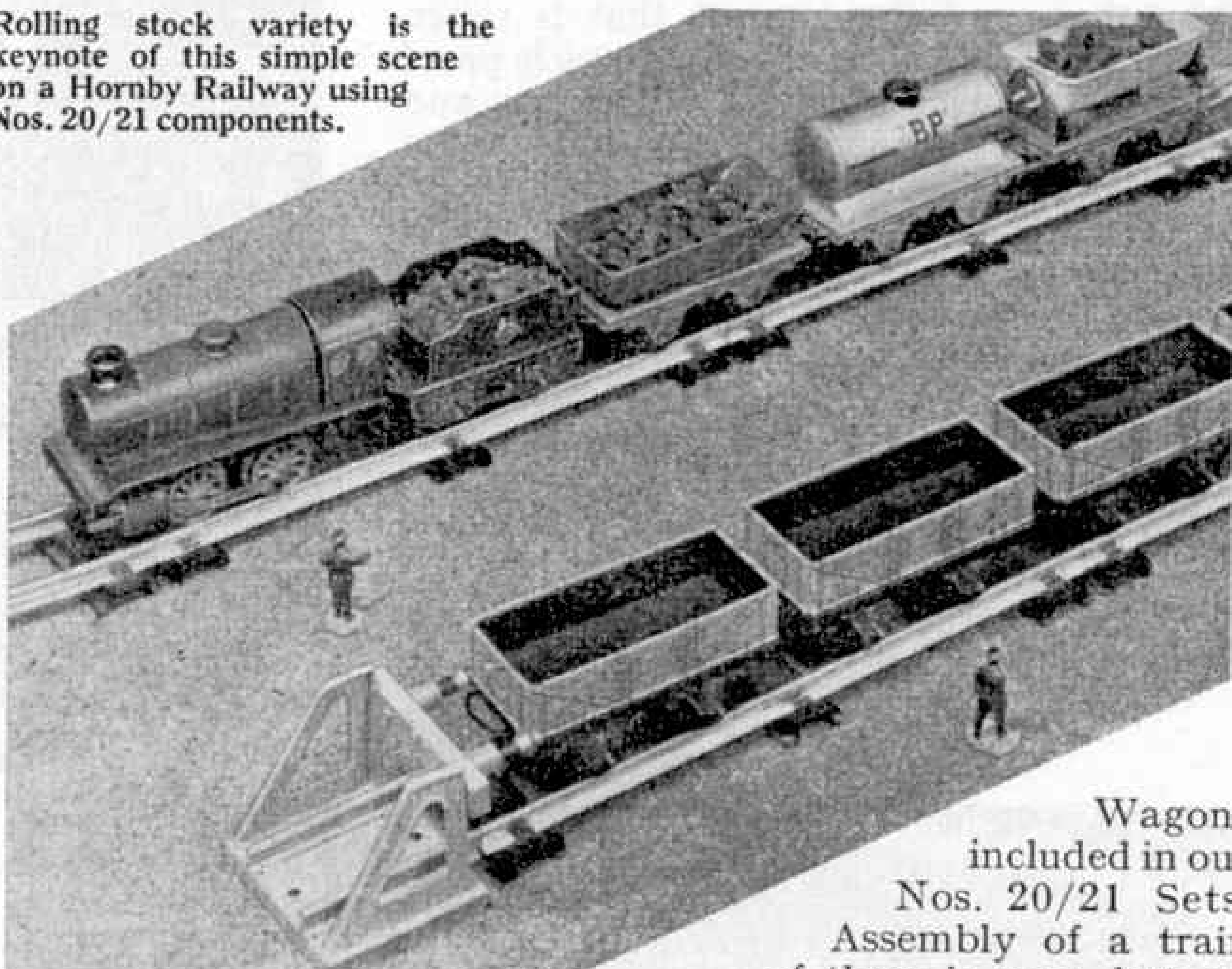
After some preliminary running, in which he becomes acquainted with the simple duties of the Hornby engine driver, every owner begins to look for ways and means of adding to the fun, either by making his railway longer, or by adding more rolling stock—or, better still, by both.

To take rails and other track materials first, these must correspond with those already in the Train Set. Beginners with Nos. 20/21 and M1 Sets are reminded that the curved rails in these sets are of what are known as the 1 ft. radius type, and any curves, points or crossings that are added should also be of the 1 ft. radius type. You may wonder why an Acute Angle or a Right Angle Crossing should be described as of 1 ft. radius or 2 ft. radius type, as the intersecting tracks forming the Crossing are straight. Actually, they are described in this way because

they are designed to fit into layouts including curves of the particular radius involved.

Extension of the railway means that longer trains can be run, or at least we can have some more rolling stock on the line. Here again one has to be sure that any new vehicles are of corresponding type to those already in use. There is quite an attractive choice of additional stock in the No. 20 range and these neat little Wagons have the same fixed tongue and loop couplings as the Coaches or

Rolling stock variety is the keynote of this simple scene on a Hornby Railway using Nos. 20/21 components.



Wagons included in our Nos. 20/21 Sets.

Assembly of a train of these is easy, but we must have all the vehicles the right way round, as each one has a loop coupling at one end and a tongue at the other.

For example, if you have begun with a No. 20 Goods Set you can add further goods vehicles. You can also introduce passenger coaches of the No. 21 type and so build up a passenger train as an alternative to attach behind the tender of your No. 20 engine. All this may seem very elementary, but it is possible for these things to be overlooked in the excitement of getting something new for the railway.

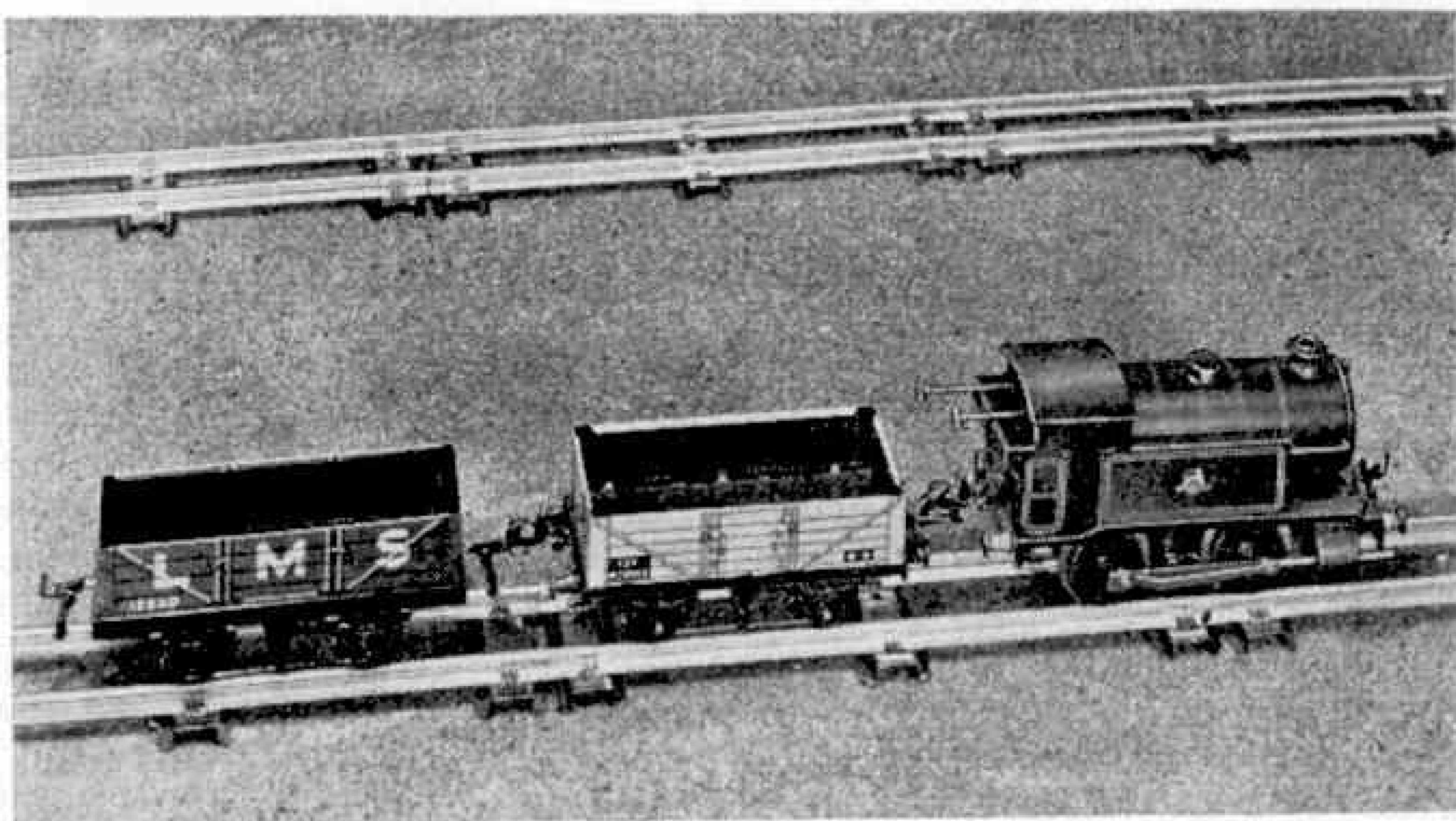
As far as layouts are concerned the beginner with the M1 train is in the same position as the one who starts off with Nos. 20/21 equipment. He has 1 ft. radius

An M1 Wagon and a Hornby Wagon No. 1 coupled together, both of them in charge of a No. 40 Tank Locomotive.

rails in his Set and extensions should be carried out with material of similar type.

The M1 owner can introduce a little more variety into his layout, if only because the M1 locomotive is fitted with a reversing mechanism. This means that the engine can travel either chimney or tender first, and this can have its effect on the track system. For instance, on a layout with a No. 20 engine, which does not reverse, you should have a track adapted for continuous running. With an M1 locomotive this is not quite so necessary, for the M1 engine can run into a dead end siding and can quite easily be reversed out again. So the M1 owner can make full use of sidings, which provide great fun.

M1 stock is not available for separate sale at present, and Nos. 20/21 vehicles will not do, as they form a class by themselves. This means that, except for Nos. 41 and 51 Coaches and Passenger Brake Vans, which will not run on 1 ft. radius track, the M1 owner looking for

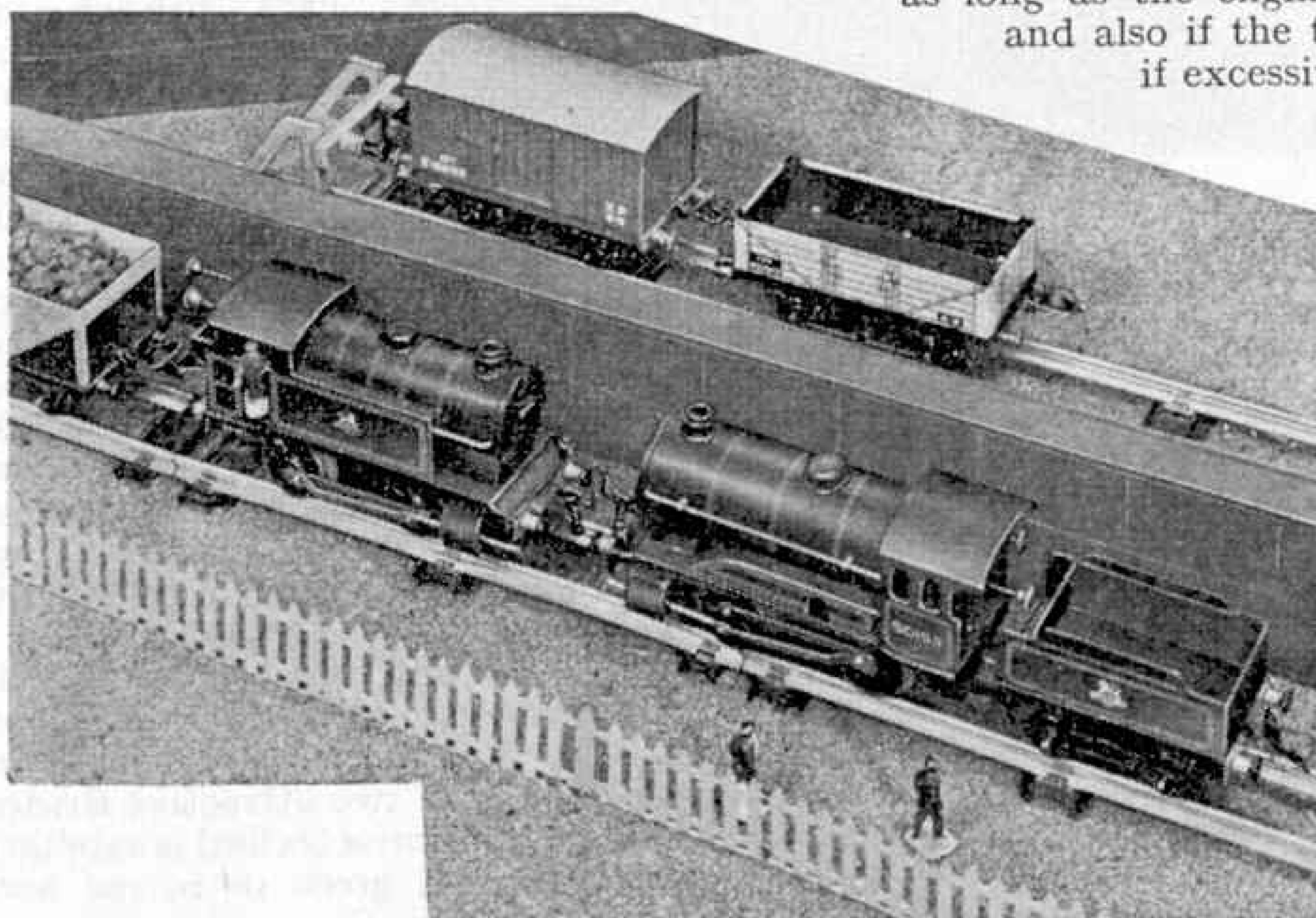


additional rolling stock for his train has to select his vehicles from the standard range of Hornby stock fitted with automatic couplings.

Now the rolling stock in the M1 Train Set has couplings of the hook and link type, and M1 owners who add further wagons or vans of the standard Hornby type sometimes wonder how to use the two types together. Actually the solution is quite simple. The wire loop of the automatic coupling must be placed over the hook of the plain coupling. There is nothing more to it than that. The owner of a Hornby reversing locomotive wishing to couple standard stock to his engine at the front end follows exactly the same plan, for there is a hook and link coupling at this end of his engine.

The arrangement works quite well as long as the engine is pulling its load, and also if the train is being pushed, if excessive speeds are avoided

and the curves are not too complicated. A "controlling hand" on the engine itself, as recommended last month when I told you how to *Shunt with Care*, will be helpful during these operations.



The "Engine Road," where two Hornby Locomotives stand waiting for their next turns of duty.

DINKY NEWS

By **THE TOYMAN**

Brighter Dinky Motor Cars

MY pictures this month illustrate a new and striking development in the finish of Dinky Toys cars. Two of them show actual examples of the Dinky Toys in the new two-colour finish and the others show cars in the new colours in specially designed scenes.

Many of you may already have noticed the Dinky Toys that are already finished in this two-tone scheme. Those who have not already seen what a wonderful effect this new enamelling has given can judge

some of the cars sprayed with two-tone finish, all highly decorative whether in pastel shades or more highly coloured. They are particularly welcome in the dark days of the present season, and will add to the gaiety of the scene when summer returns.

It is quite certain that all Dinky Toys enthusiasts will be delighted with the application of the new two-tone schemes to their favourite miniatures, as seen in the examples already available, and will

look forward eagerly to other Dinky Toys vehicles that later on will appear in the new finish. You will realise of course that all



On the icy road in this winter scene is the new two-tone Morris Oxford, Dinky Toys No. 159. The other car is the Rover 75 Saloon, Dinky Toys No. 156, also finished in a two-tone colour scheme.

for themselves by turning to the back cover of this issue of the Magazine, where they will see these Dinky Toys in their new form.

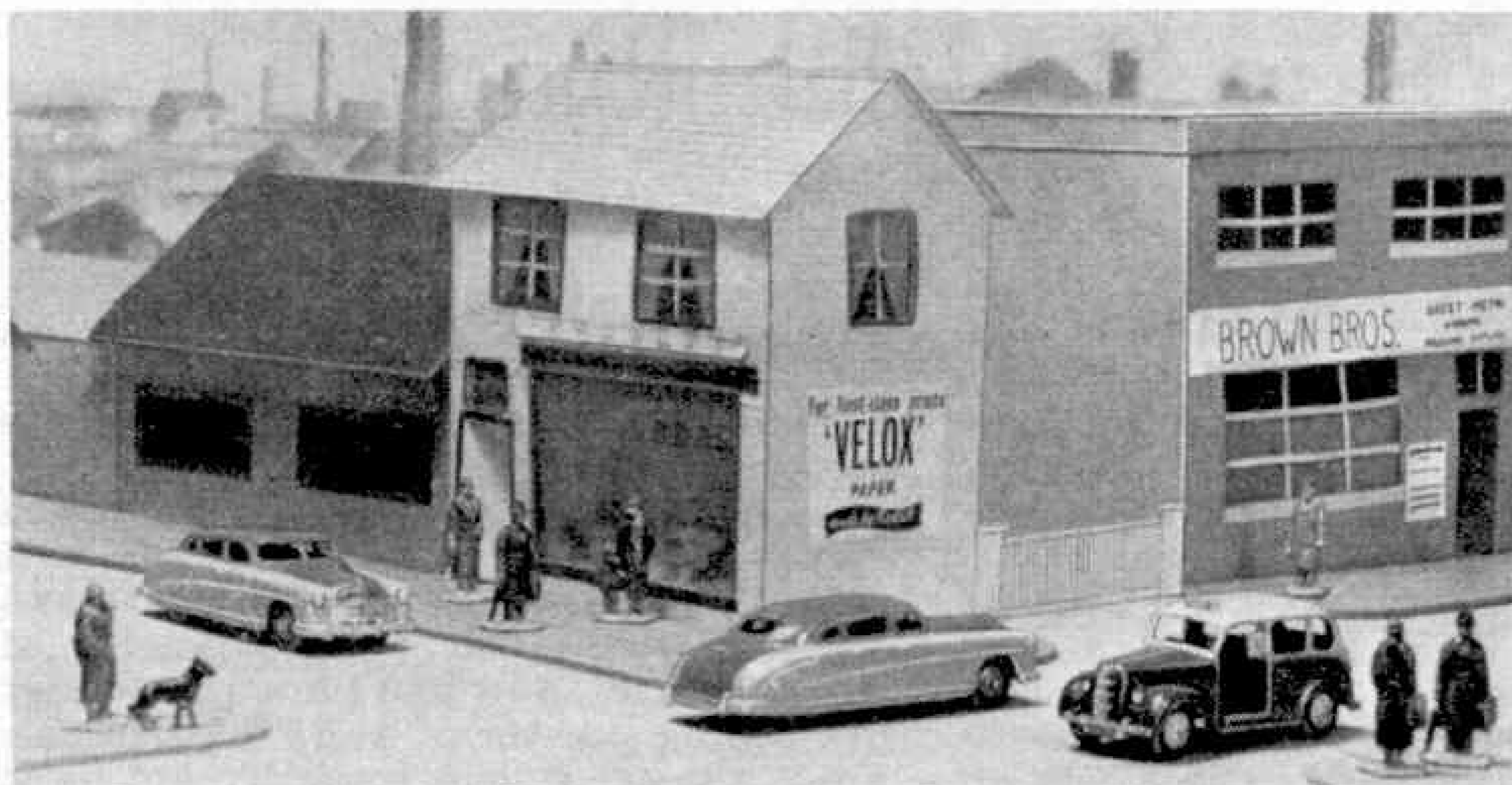
The decision to introduce brighter Dinky Toys cars, in attractive combinations of two colours, was made some time ago, and it was therefore very interesting to find that many of the new cars on view at the Motor Show at Earls Court last October showed the same step forward. The appearance of our streets is now brightened considerably by the appearance of well-known motor cars in striking combinations of two colours, and I am sure that I need not give you any examples of this, as you must have seen for yourselves

the Dinky Toys cars cannot be changed at once!

The first four to be introduced in these attractive colours are the

Rover 75 Saloon, No. 156; the Morris Oxford Saloon, No. 159; the Hudson Commodore Sedan, No. 171; and the Austin Taxi, No. 254. These models are illustrated in my pictures and I think you will agree that in these the new two-tone colour schemes look most impressive, and that the Dinky Toys already in their new colours are splendidly attractive.

The Rover 75 and the Morris Oxford are each available in two separate colour schemes. The Rover can be obtained in cream and blue or in two attractive shades of green, while the Morris Oxford is supplied either in cream and green or in red and white. The Hudson Commodore also is



A cross-roads scene in a Dinky town layout, showing the Hudson Commodore and the Austin Taxi finished in the new two-tone colour scheme.

available in two different colour schemes, either blue and red or blue and grey. The Austin Taxi is attractively finished in yellow and green.

My first picture shows the Morris Oxford and the Rover 75 in a typical wintry setting. The owner of the Rover has just finished the arduous task of clearing a path from his garage to the road, and has left



The Morris Oxford Saloon, Dinky Toys No. 159 is one of the cars now finished in the new style.

his car in the drive while he closes and locks the garage doors. The Morris Oxford's driver is evidently experiencing a bit of trouble in negotiating the icy road!

Of course the scene in the picture is not as cold as it seems. The "snow" is ordinary salt sprinkled over the layout, as described in one of my articles last year. The result is very effective, however, and it makes a pleasant and seasonal change from the usual Dinky Toys scene. Incidentally it affords a splendid opportunity to

organise really interesting schemes for clearing the roads for traffic, just as in real life. Please be careful with the salt, however, and make sure that it "snows" only within the borders of Dinkyland!

My second picture is a typical crossroads scene in a miniature town and shows the Hudson Commodore Sedan and the Austin Taxi. These attractive models look really well in a street layout, as you can see, and of course the Taxi is just the thing for carrying passengers to the station if your layout includes a miniature railway

More models in new two-tone finishes will be introduced, so look out for further details.

Now for an unusual story that I have been meaning to tell you for some time. A few months ago I received an interesting letter from a lady describing the amazing adventure of a Dinky Toy owned by her young son. The lady and her son, who was holding the Dinky Toy, were crossing a busy street in the West End of London. In the crush and bustle the model was dropped and was run over by a heavy vehicle. When picked up, it was found to be scarcely damaged!



The Rover 75 Saloon, Dinky Toys No. 156, in the new two-tone colour finish.

Easy Model-Building

Spanner's Special Section for Juniors

A DECK chair that can be built from Outfit No. 0 and a Railway Service Crane for Outfit No. 3, form the two new models that I have for you this month. To begin with the Deck Chair, take two $5\frac{1}{2}$ " Strips 1 and join them together at one end by a $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip 2. Now take two more $5\frac{1}{2}$ " Strips 3 and connect these also by a $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip (see 4 in Fig. 1.). Pass a $3\frac{1}{2}$ " Rod 5 through holes in two sets of $5\frac{1}{2}$ " Strips and hold the Rod in place by fixing a Spring Clip at each end.

The next step is to pass a bolt through a $2\frac{1}{2}$ " Strip 6 and through a hole in one of the Strips 3. Screw two nuts tightly against each other on the bolt but make sure that the Strip 6 is able to move freely. Then attach another $2\frac{1}{2}$ " Strip to the second one of the Strips 3 in the same way.

Next bolt a $2\frac{1}{2}$ " Stepped Curved Strip 7 to two Angle Brackets, using $\frac{3}{8}$ " Bolts 8 for this purpose. Now pivot the Angle Brackets on lock-nutted bolts passed through the Strips 6. The ends of the Bolts 8 should fit into the slotted holes in Angle Brackets 9, which are fixed to the Strips 1. You can complete the model by bolting a piece of paper or cloth to the Double Angle Strips 2 and 4 to make the seat and back of the Deck Chair.

Parts required to build the Deck Chair: 4 of No. 2; 2 of No. 5; 4 of No. 12; 1 of No. 16; 2 of No. 35; 20 of No. 37a; 14 of No. 37b; 4 of No. 38; 2 of No. 48a; 1 of No. 90a; 2 of No. 111c.

Railway Service Crane

You should begin making this model by building the wheeled base, the top of which is a $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flanged Plate. Bolt two $2\frac{1}{2}$ " Stepped Curved Strips to each side of the Flanged Plate, and use these to support the axles, which are $3\frac{1}{2}$ " Rods. The wheels are 1" Pulleys, but before you

fix them in place you should place two $5\frac{1}{2}$ " Strips 1 over the axles as shown. The 1" Pulleys serve to hold the Strips in position.

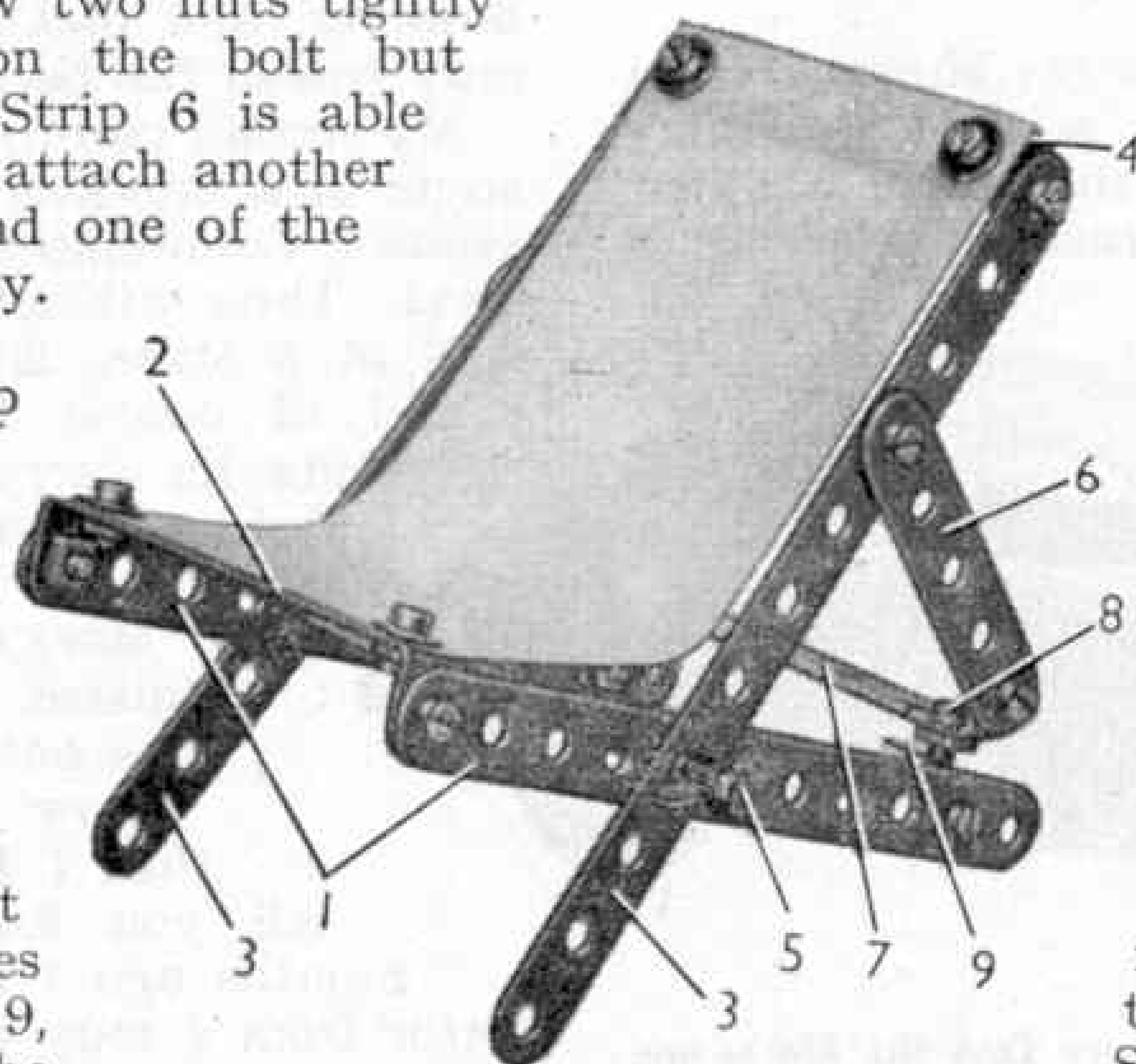
To assemble each side of the cab you should take a $5\frac{1}{2}$ " Strip 2 and bolt to it a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Triangular Flexible Plate and a $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate strengthened by a $2\frac{1}{2}$ " Strip. Now join the sides together by bolting to them a $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip 3, and two Trunnions 4 connected by a $2\frac{1}{2}$ " Strip. The bolts fixing the Trunnions in place support also two Flat Trunnions 5. The cab roof

is made from a curved $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate and two curved $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Triangular Flexible Plates bolted to the sides. The $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate is strengthened along its rear edge by two Formed Slotted Strips.

You should make the back of the cab by fixing a straightened $1\frac{1}{8}$ " radius Curved Plate to the Double Angle Strip 3. The top corners of this Plate are then connected to the sides by Angle Brackets,

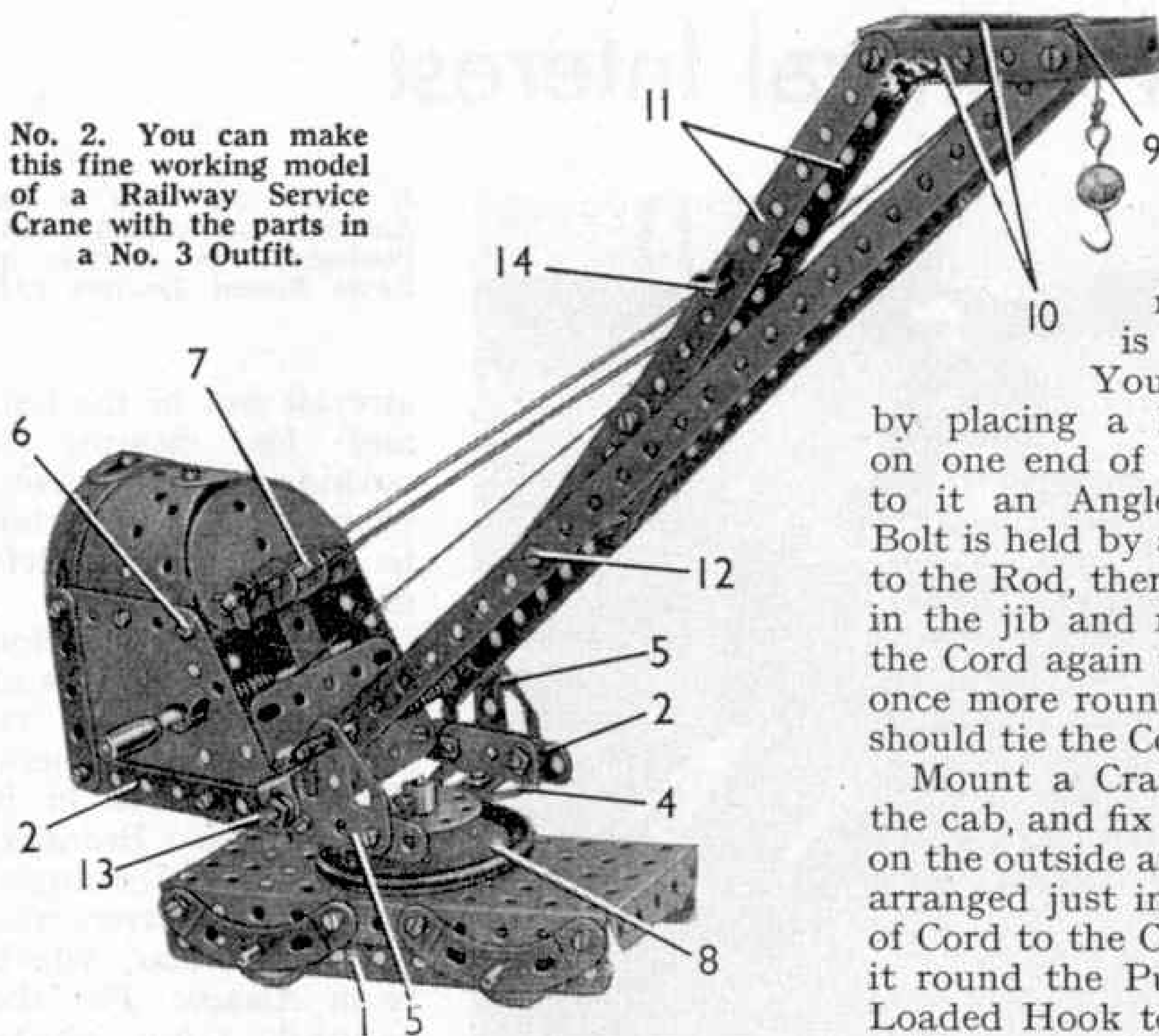
and these support also a Semi-Circular Plate. You can now assemble the front of the cab by fixing a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate to Angle Brackets bolted to the Strips 2. Fix a Semi-Circular Plate to a $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip held by bolts 6, and fasten a $2\frac{1}{2}$ " Strip between the Semi-Circular Plate and the $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate. Use the bolt that fixes the Strip in place to support also a Double Bracket, and mount a 2" Rod 7 in this part, holding the Rod in place with Spring Clips.

The cab can now be mounted on the wheeled base. Fix a Bush Wheel at one end of a 2" Rod, then pass the Rod through the $2\frac{1}{2}$ " Strip bolted to the



No. 1. A simple folding Deck Chair you can build with the parts in a No. 0 Outfit.

No. 2. You can make this fine working model of a Railway Service Crane with the parts in a No. 3 Outfit.



Trunnions 4. The next step is to place a Road Wheel 8 on the Rod, which is then passed through the centre hole of the $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate and is fixed in place by a second Road Wheel arranged below the base.

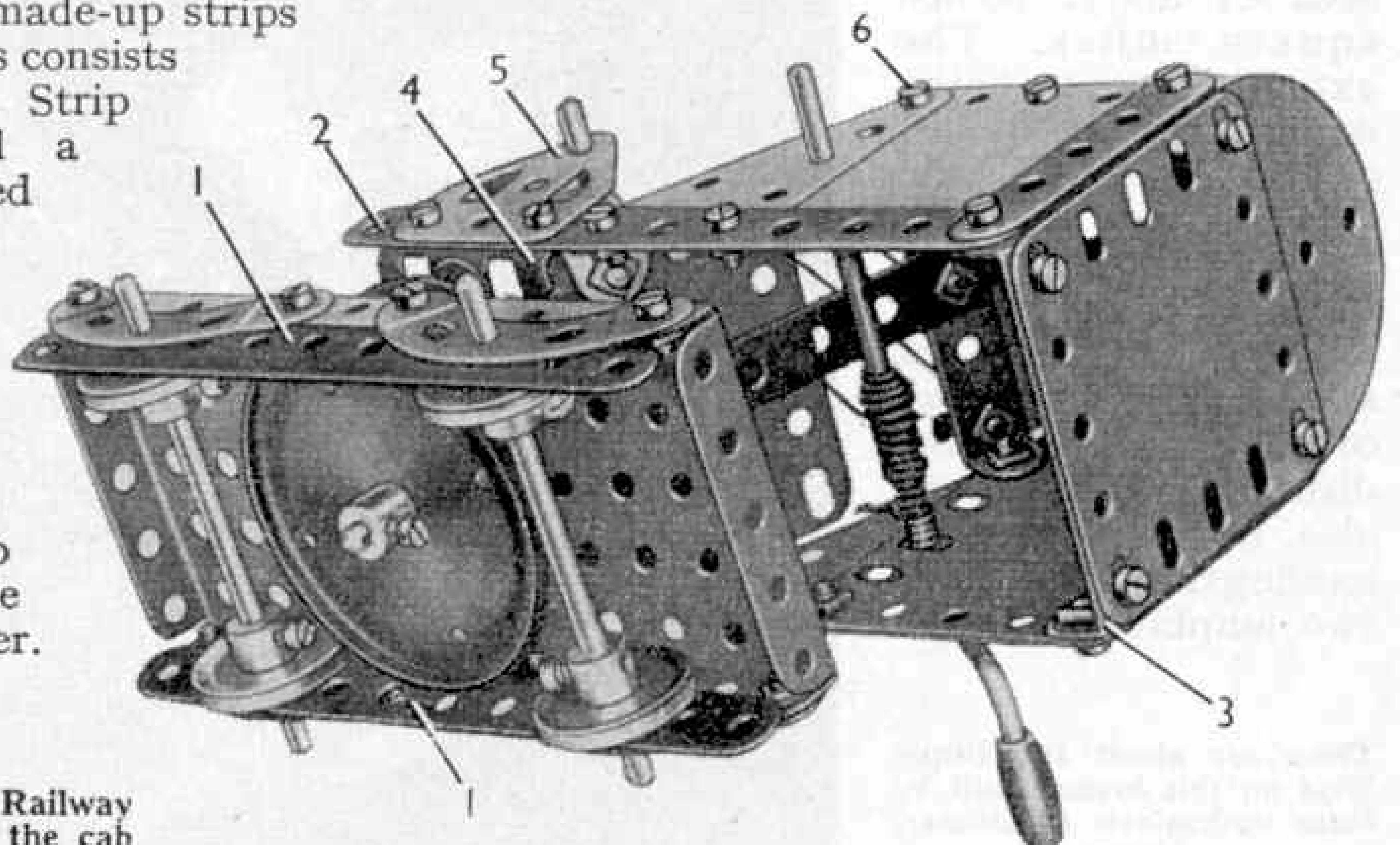
Make the jib by taking two $12\frac{1}{2}''$ Strips and connecting them at their upper ends by a Stepped Bent Strip. One of the bolts used for this purpose should be $\frac{3}{8}''$ in length, and you should place on the shank of this Bolt a $\frac{1}{2}''$ loose Pulley 9. The bolts fixing the Stepped Bent Strip in place are used also to support $2\frac{1}{2}''$ Strips 10, and these should be connected to the $12\frac{1}{2}''$ Strips by made-up strips 11. Each of these strips consists of a $5\frac{1}{2}''$ and a $2\frac{1}{2}''$ Strip bolted together, and a Double Bracket is bolted between the ends of the Strips 10 and the strips 11. The $12\frac{1}{2}''$ Strips are connected by a made-up bracket held by bolts 12. This bracket consists of two $\frac{1}{2}''$ Reversed Angle Brackets bolted together.

The jib hinges on a $3\frac{1}{2}''$ Rod mounted in the Flat Trunnions 5, and is held on the Rod by Spring Clips. This Rod is also the winding shaft for the Cord used to raise or lower the jib, and is fitted with a handle 13.

You should make the handle by placing a Rod and Strip Connector on one end of the Rod and then bolting to it an Angle Bracket in which a $\frac{3}{8}''$ Bolt is held by a nut. Tie a length of Cord to the Rod, then pass it round a $1\frac{1}{2}''$ Rod 14 in the jib and round the $2''$ Rod 7. Take the Cord again round Rods 14 and 7, then once more round the Rod 14. Finally you should tie the Cord to one end of the Rod 7.

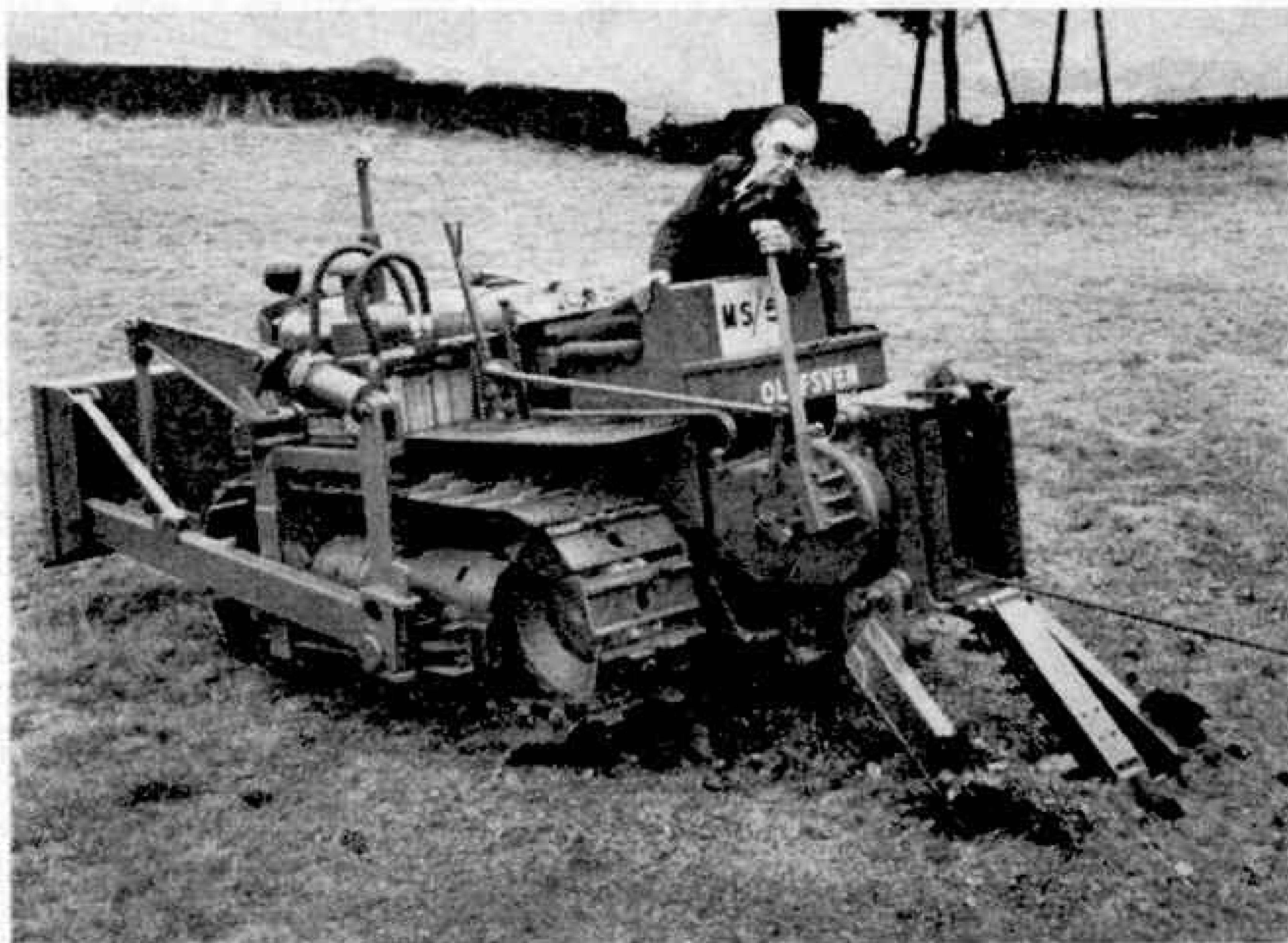
Mount a Crank Handle in the sides of the cab, and fix it in place by a Spring Clip on the outside and a Cord Anchoring Spring arranged just inside the cab. Tie a length of Cord to the Cord Anchoring Spring, pass it round the Pulley 9 and fasten a Small Loaded Hook to the free end of the Cord.

Parts required to build the Railway Service Crane: 2 of No. 1; 6 of No. 2; 8 of No. 5; 2 of No. 11; 5 of No. 12; 3 of No. 16; 2 of No. 17; 1 of No. 18a; 1 of No. 19g; 4 of No. 22; 1 of No. 23; 1 of No. 24; 6 of No. 35; 48 of No. 37a; 46 of No. 37b; 4 of No. 38; 1 of No. 40; 1 of No. 44; 2 of No. 48a; 1 of No. 52; 1 of No. 57c; 4 of No. 90a; 2 of No. 111c; 2 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 176; 2 of No. 187; 1 of No. 188; 1 of No. 189; 2 of No. 190; 1 of No. 200; 1 of No. 212; 2 of No. 214; 2 of No. 215; 4 of No. 221.



No. 3. Another view of the Railway Service Crane showing how the cab is mounted on the wheeled base.

Of General Interest



A tractor for work in the Antarctic undergoing trials. Photograph by courtesy of David Brown Tractors Ltd.

Antarctic Tractor

A tractor that has to work in the frozen wastes of the Antarctic has to be very carefully designed to make sure that it will stand up to the extreme conditions it will meet. This has been done for the David Brown 30ITD Diesel Tracklayer tractor shown in the upper illustration on this page, for this is being taken to Graham Land, in the Antarctic, by the Hunting Aerosurveys Ltd. expedition that is to survey from the air an area of about 50,000 square miles. The expedition is being undertaken on behalf of the British Colonial Office.

The tractor will be used chiefly for hauling sledges and for transporting members of the expedition short distances, but it will also be employed for hauling the expedition's two amphibious Canso

There are about 100 Dinky Toys on this layout built by three enthusiasts in Colmar, Alsace.

aircraft out of the sea, and for clearing a parking area for them, when storms threaten to damage them if left in the water.

The lower illustration on this page will be of special interest to Dinky Toys owners. The three boys in it are Andre Bronner, Jean-Marc Dirninger and Claud Matter, who live in Colmar, which is in Alsace. For the second time these enthusiasts have built

up a Dinky Toys layout for a special exhibition. The layout included a railway track as well as a road system, which is provided with correct road signs, and on it they used 100 Dinky Toys cars and lorries, which made a splendid picture.

Their effort aroused the greatest interest. The local authorities assisted with the layout of the town, and newspapers recognised their skill by describing and illustrating their exhibition.



An Export Problem

New Assembly Process for Oil Equipment

HOW would you move a giant storage hopper vessel, measuring 30 ft. across and 87 ft. high, from Darlington to South America? This is the problem that faced the experts when storage vessels of this size were required for storing the catalyst to be used in cat-crackers to be built in refineries of the Shell Petroleum Company in Venezuela and Curacao. Cat-crackers and their use of a catalyst will be familiar to readers from the article in the June 1954 *M.M.* on the Shell refinery at Stanlow.

Normally, in cases of this kind, the structures to be moved overseas are designed in small sections that can readily be handled, and they are assembled when they reach their destination. It was the first intention



Our two illustrations show parts of a catalyst hopper on a floating crane on Tees-side, and one of the parts being lowered on to the deck of the vessel in which they travelled to South America. Shell photographs.



to follow this scheme with the four catalyst storage hopper vessels for the Shell refinery extensions, which were made by Messrs. Whessoe Ltd., Darlington. Each of the vessels would in that event have comprised more than 110 plates and component parts, making a total weight of 660 tons.

Assembling and welding these parts at the refineries would have taken a considerable time, so to speed things up it was decided to build each hopper so that it consisted of only five sub-assemblies, and to send these out as deck cargoes.

To put the new plan into operation land at Middlesbrough was secured that had deep water adjacent. A programme of construction and shipment was then agreed, after which the erection and welding crews of Whessoe Ltd. set to work. The assemblies were tested on the site, and each was then lifted by means of a 60-ton floating crane on to the deck of the vessel that was to carry it to South or Central America.

Railway Notes

By R. A. H. Weight

British Railways Developments

The normal rail length on most of our main lines is 60 ft. Much longer experimental welded lengths are installed at various places, notably at Crewkerne on the S.R. main line between Salisbury and Exeter, where there is a 1,800 yd. stretch laid, also somewhat unusually, on concrete sleepers.

The usual welded rail length so far has been 300 ft., that is five rails joined together, the work being carried out at a permanent-way depot, as for Crewkerne, by the electric flash butt method, the rails being then conveyed on flat wagons to the site. On arrival a portable "Thermit" welding apparatus is used to form the continuous length.

Careful measurements are being taken, in conjunction with laboratory tests, to ensure necessary safeguards as regards distortion of the long rails in hot weather, as well as to record their behaviour under fairly heavy traffic. Regular travellers may miss the familiar rail joint rhythm and perhaps

B.R. No. 80004, one of the standard 2-6-4 Tanks working in the Scottish Region at Fraserburgh. Photograph by G. H. Robin.

note greater smoothness while passing over this or other long welded lengths.

It is proposed to lay out near a main line in the Midlands a series of curved and straight tracks for test purposes where the running of locomotives or vehicles can be studied at various speeds, up to say 60 m.p.h., on various types of line that may for the purposes of trial be in good or worn condition, or perhaps incorporate experimental material or components.

A new heavy engineering laboratory for B.R. Research Department is to be built, adding to present facilities at Derby.

'Twixt London and Manchester

The shortest, quickest and most patronised routes are those from Euston, through Stafford and Crewe, or Stoke-on-Trent and Macclesfield. Mileage is less by the latter, though it is not so easily graded. A number of expresses each way with fast timings, including the *Mancunian* and *Comet*, makes the journey in from 3 hr. 20 min. to 4 hr. according to route, load and number of stops. They are hauled usually by Britannia Pacifics, Scots, rebuilt Patriot or Jubilee 4-6-0s, or sometimes by L.M.R. 4-6-2s via Crewe.

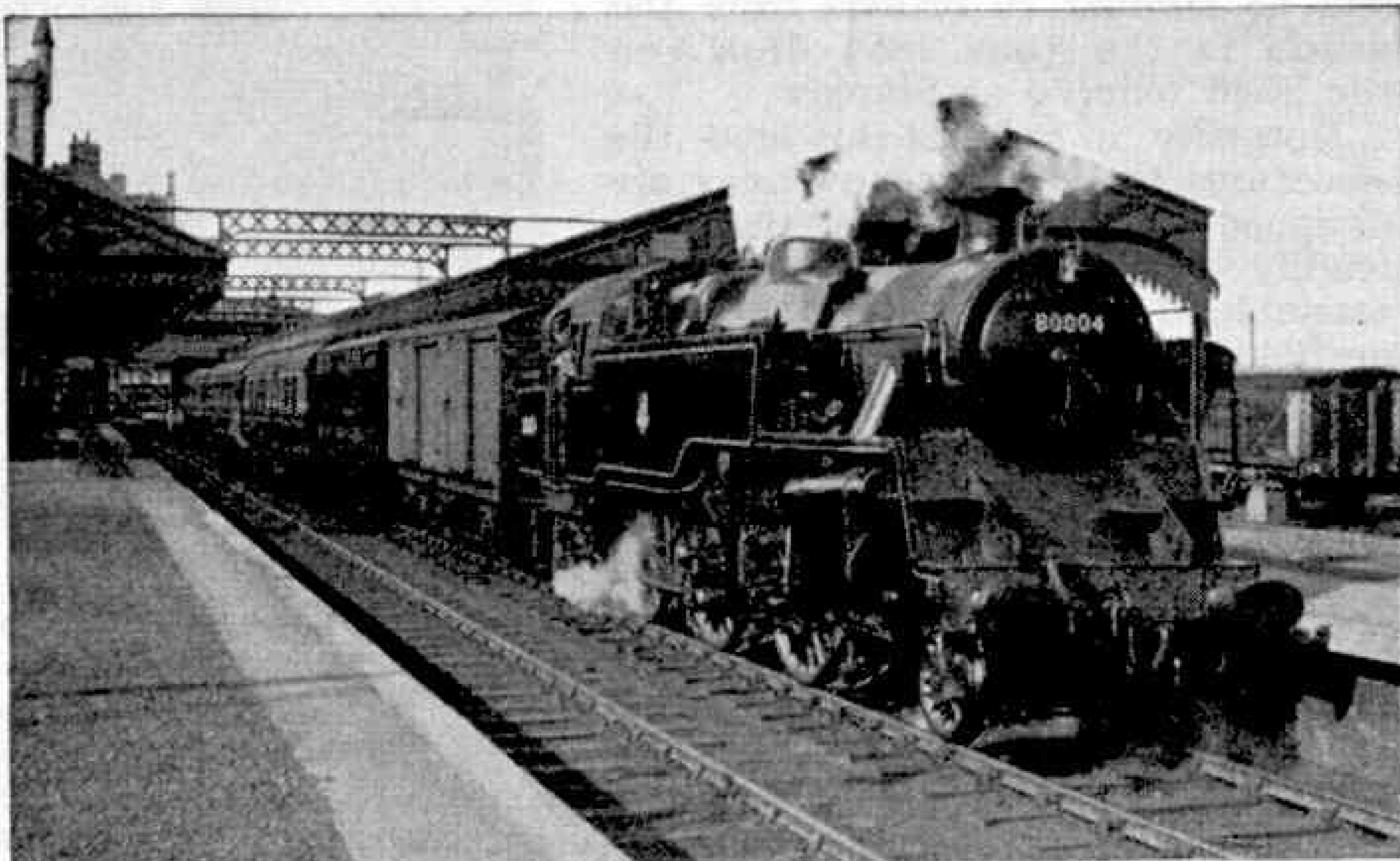
On a busy summer Saturday I was a passenger by the 12.37 p.m. from Euston, allowed 164 min. for the 146 miles to the first halt at Stoke, and just over 3½ hr. to Manchester. Unnamed Britannia

No. 70044 had a 15-coach load, almost 500 tons behind the tender. As there was no banking assistance from the platform up the initial steep rise to Camden sheds it was a tough start. There were signal checks through Willesden and Wembley—the *Red Rose* hauled by a Scot had left only a few minutes in front bound for Liverpool only—but after topping the long rise to Tring, 76 m.p.h. was attained down the subsequent descent, though track repair and signal slowings followed around Bletchley and Wolverton.

We were 13 min. down when passing Roade, 60 miles out. With a clear road, however, the next 67 miles to Colwich, where we diverged slowly from the West Coast main line, were covered in 65½ min., passing Rugby, where there is a service slack, at 45 m.p.h., Nuneaton at 70 and Lichfield (uphill) at 62. Stoke was reached less than 6 min. behind schedule or, allowing for delays, in no more than 156 min. net. The Crewe route is rejoined at Cheadle Hulme before Stockport.

Another L.M.R. way is the rather longer 190-mile St. Pancras-Manchester (Central) route via Derby, through the scenic Peak District, which I hope to describe briefly soon.

The former Great Central service still available from Manchester to a limited extent takes us by way of Sheffield, Nottingham, Leicester, to Marylebone with



a number of stops at principal stations, the distance being a good deal further. As far as Sheffield it passes through fine moorland and hill country with severe grading.

Travel that way is now spectacular in another sense as all trains between the Manchester and Sheffield areas are hauled by powerful electric locomotives, as recently described by the Editor. In a 6-coach train headed by Co-Co, No. 27001, one of the larger, 12-wheeled engines, I was rather thrilled as we swept up the 1 in 117 climb at nearly 60 m.p.h., entering the clean and electrically-lighted new Woodhead Tunnel at 57 m.p.h., rising to 59 up the 1 in 129 gradient, which continues for the first 2 miles within it. We were through in 3 min. 12 sec., subsequently making the long descent at round about 60, reaching Sheffield in exactly 1 hr. from Manchester, London Road, including three stops and two extra slowings.

London Midland Miscellany

On the day of my northward journey from Euston mentioned above 4-6-2 *City of Stoke-on-Trent*, still in blue livery, was at Camden depot between London-Morecambe journeys on the *Ulster Express*. *Duke of Gloucester* was preparing to take the *Midday Scot*,

A Britannia No. 70028 Royal Star leaving Reading (General) with an express for Pembroke Dock. Photograph by M. W. Earley.



and a semi-fast to Northampton and Crewe was hauled by a class 5 4-6-0 piloted by compound 4-4-0, 41165.

Diesel electric main line locomotives of the L.M.R. and Southern types, numbered 10000-1 and 10201-3, have been reported running various expresses to and from Euston, Carlisle, Glasgow, Crewe, Wolverhampton or elsewhere, and to have kept time with some of the Region's fastest trains.

More of the powerful 2-10-0 freight engines completed at Crewe have gone into Midland Division service, carrying numbers 92053-9. Derby Works construction of class 5 4-6-0s continues in the 73090 series, the first four of those being allocated to 10C, Patricroft, Lancs. The recently finished batches of 350 h.p. 0-6-0 diesel-electric shunters have included Nos. 13173-81 to work from various L.M.R. depots, followed by a series for service on the Western Region.

Market Harborough Motive Power depot has been numbered 2F. To fill gaps the code for the following sheds has been slightly altered: Sutton Oak, now 10D; Penrith 12B; Workington 12C; Kirkby-in-Ashfield 16B; Mansfield 16C; Lees 26E; Belle Vue 26F.

Locomotives in the News

Described as the most powerful of its kind in the world, the *Deltic*, the 12-wheeled 3,300 h.p. diesel-electric express locomotive built and owned by the English Electric Company, is powered by two 18-cyl. Napier Deltic engines. At the time of writing it was undergoing trials on the L.M.R., including main line running.

Doncaster-built class 5 B.R. 4-6-0s numbered 73100-4 were allocated as new engines to 67A, Corkerhill, Glasgow. Other new locomotives in Scotland include class 4 2-6-4Ts Nos. 80123-4,

assigned to 62B, Dundee; and diesel-hydraulic shunters Nos. 11704-5 to 64A, St. Margarets, Edinburgh.

The 10 class 5 4-6-0s now under construction at Doncaster numbered 73110-19 are intended for Nine Elms depot, London, S.R.; the 10 class 4 similar but smaller ones in hand at Swindon numbered 75070-9 being destined for the Southern Exmouth Junction, Exeter shed.

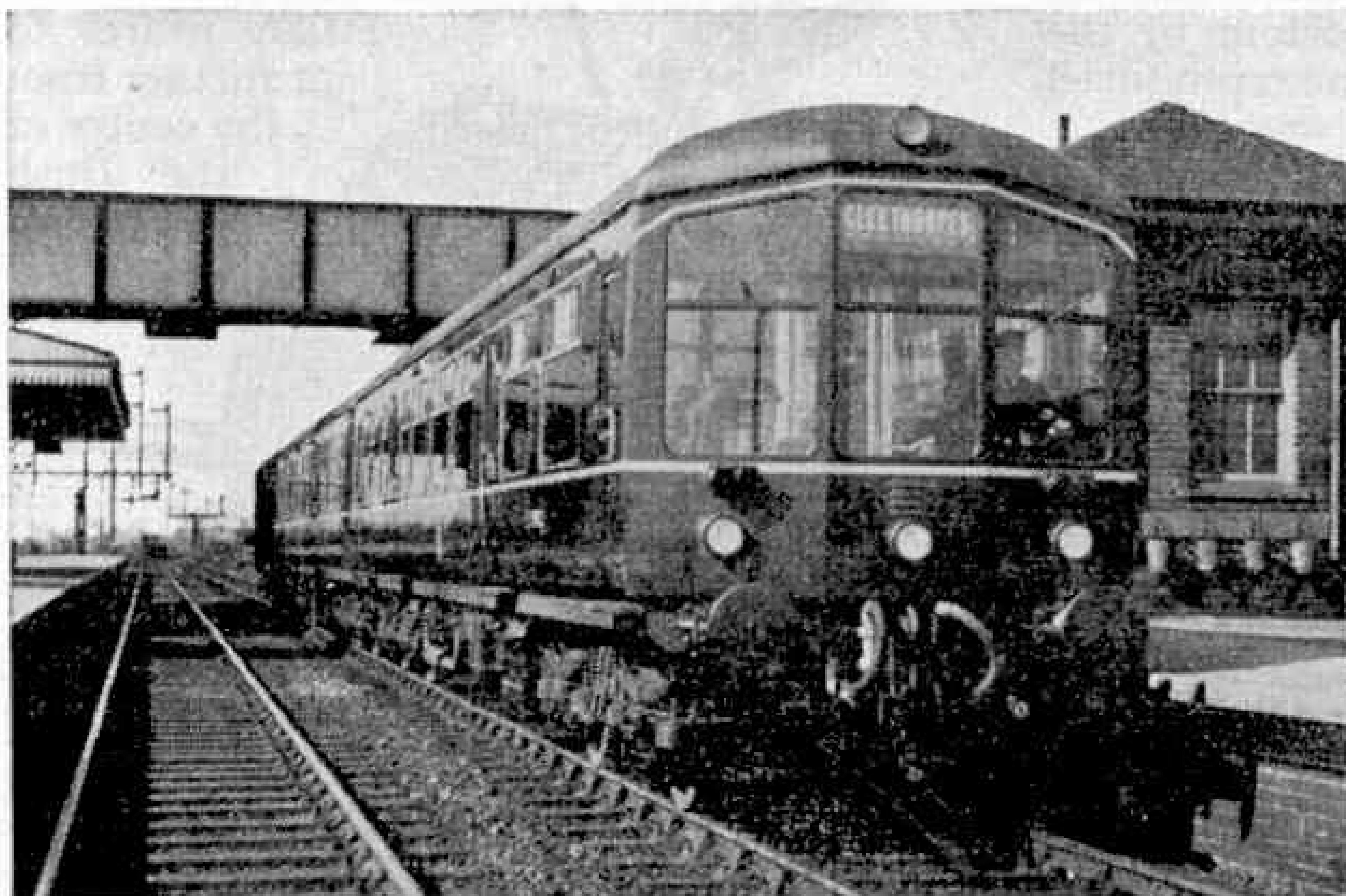
More diesel-electric shunters of the 13160 series and diesel-mechanical engines numbered 11130 and upward, are arriving on the Eastern Region.

Automatic Operation of Busy Junction

The busy double junctions at Camden Town in North London, with tracks carried over one another to avoid fouling at points of convergence, are part of the L.T.E. "tube" system and all are a long way below ground level. They carry some 1,200 trains per day. Signals and points are controlled automatically by interlocking machines actuated by train describers, which set up the required route as soon as the lines are clear and block any conflicting movement. So in quick succession northbound trains are dispatched towards either the Highgate-Barnet or the Golders Green-Edgware lines. Southbound trains are similarly directed towards the City or the Charing Cross routes.

Veteran Locomotive Prowess in Eire

Though diesel express and railcar operation has spread rapidly in Southern Ireland, and is still doing so, Mr. A. Donaldson writes that especially in summer he has recorded many enterprising and fast runs during the last few years and up to September 1955, behind steam locomotives with moderate loads. These included former Great Southern 4-4-0s that are decidedly elderly, and not receiving the best of maintenance. Among the trains were the summer 9.0 a.m. Dublin (Kingsbridge) to Waterford and back via Carlow; the 8.10 a.m. Kilkenny-Dublin, returning at 6.15 p.m., and the long runs made by 321 class 4-4-0s, built 1904 and modernised 1924, from Dublin to Cork and Tralee.



A two-coach Diesel Unit, with a parcels van attached in the rear, at Barnetby on the way from Lincoln to Cleethorpes. Photograph by R. E. Vincent.

Among the Model-Builders

By "Spanner"

A Giant Model Gold Dredge

One of the largest working models I have come across for some time has been built by Mr. B. J. Huffam, Ikamatua, South Island, New Zealand. It is a giant gold dredge and is shown in one of the accompanying illustrations. The model is based on

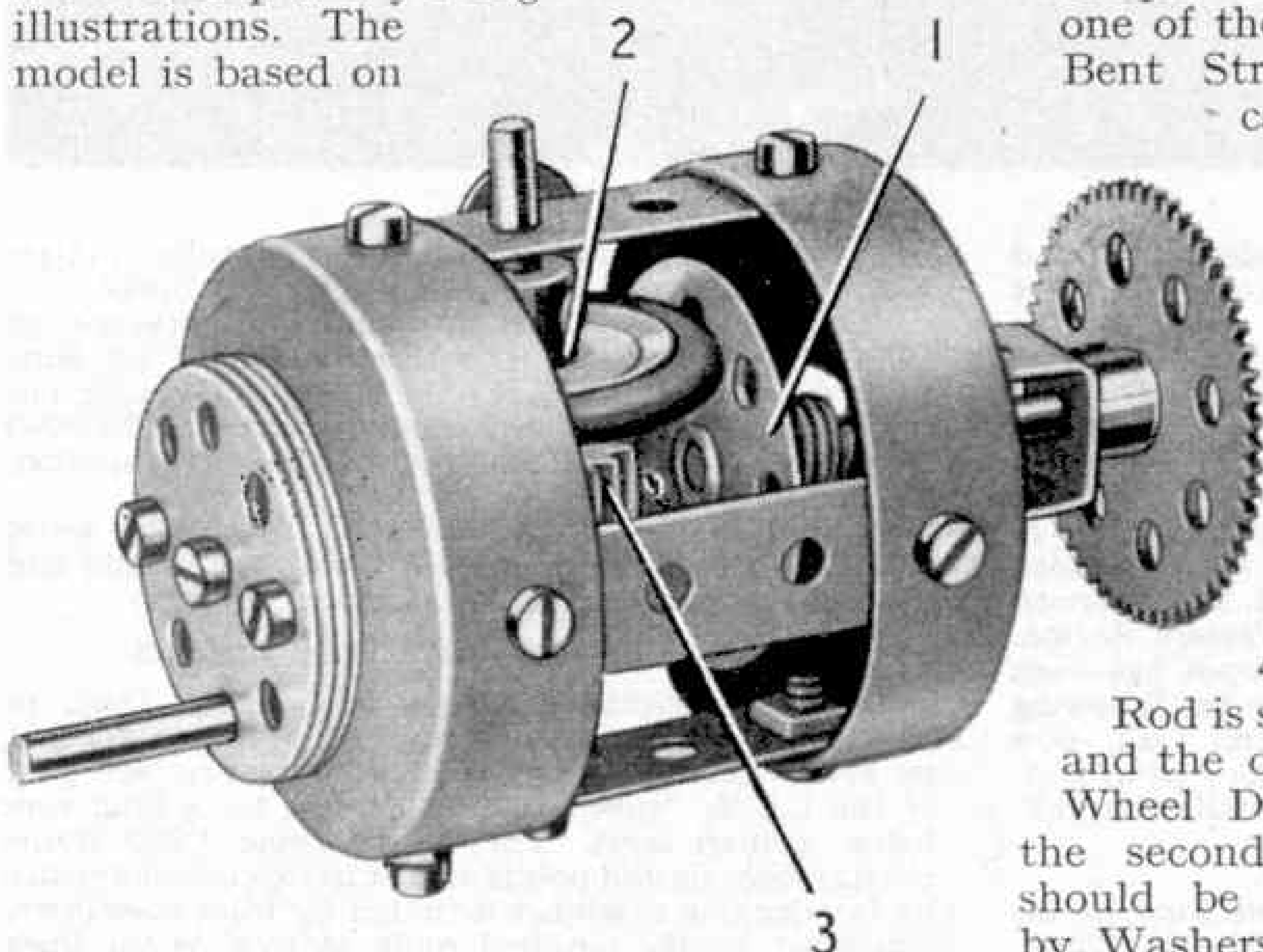


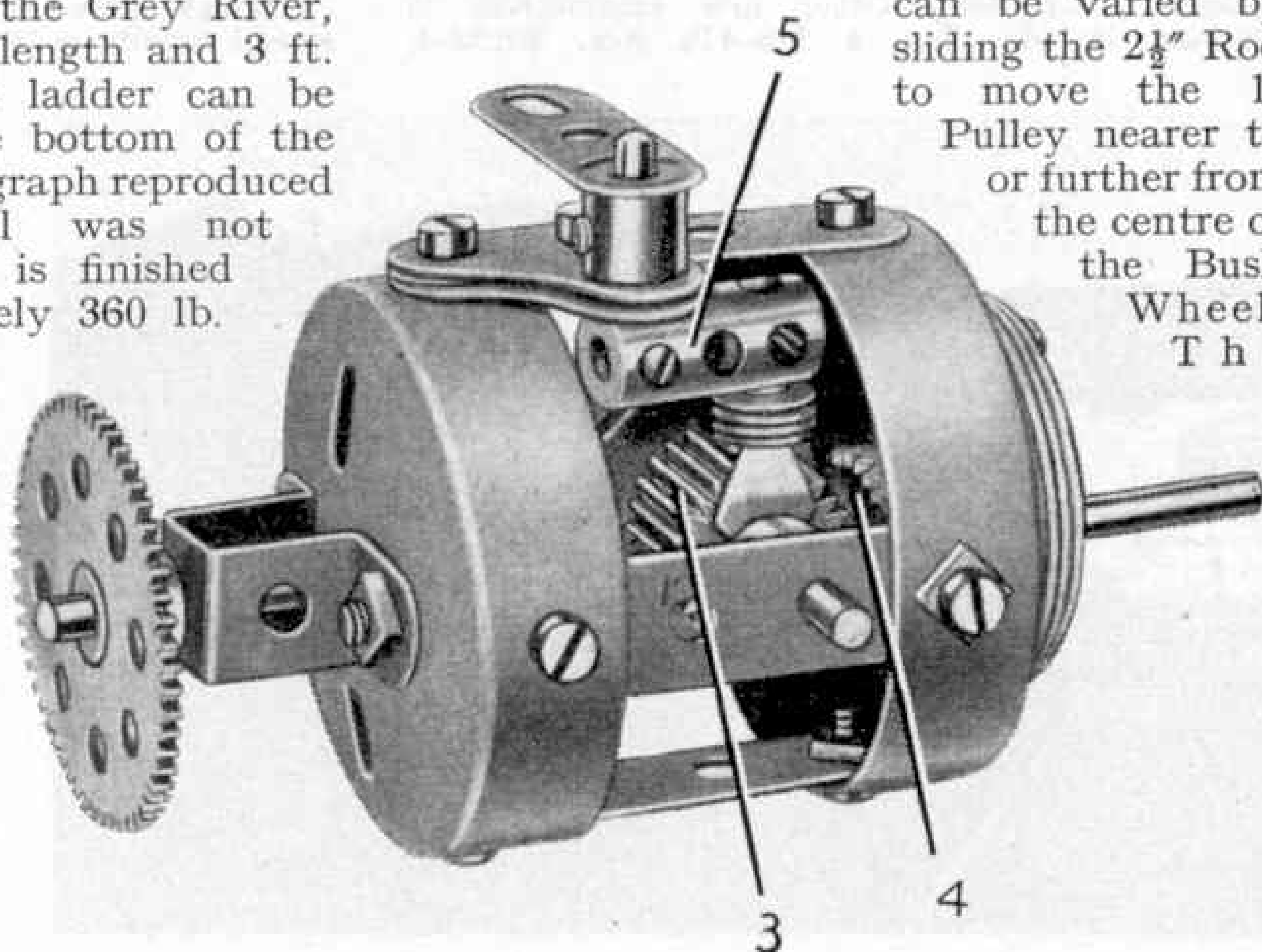
Fig. 1. This neat variable speed mechanism provides a means of obtaining speed ratios of between approximately 3:1 and 1:1.

an actual gold dredge that operated on the gold bearing flats of the Grey River, and it is 14 ft. 1½ in. in length and 3 ft. 6 in. wide. The bucket ladder can be lowered 20 in. below the bottom of the pontoons. When the photograph reproduced was taken the model was not completed, but when it is finished it will weigh approximately 360 lb. and over 12,000 nuts and bolts will have been used in its construction.

A Compact Variable Speed Mechanism

Occasionally in certain models it is necessary

Fig. 2. Another view of the variable speed mechanism showing the gear drive to the output shaft.



to increase or reduce the working speed gradually, and the variable speed drive shown in Figs. 1 and 2 should prove very useful in such cases on account of its small size.

The housing for the mechanism consists of two Boiler Ends connected by four 2" Strips. The input shaft is mounted in one of the Boiler Ends and in a Double Bent Strip bolted to it. This shaft carries at its inner end a Bush Wheel 1, with a Compression Spring between the Bush Wheel and the Boiler End.

The Compression Spring presses the Bush Wheel against a Rubber Ring on a 1" Pulley 2. This Pulley is fixed on a 2½" Rod that carries also a ¾" diameter, ½" face Pinion 3, and the latter engages a ¾" Contrate 4 on the output shaft. The 2½" Rod is supported in two of the 2" Strips and the output shaft is mounted in four Wheel Discs attached by ⅜" Bolts to the second Boiler End. The Contrate should be spaced from the Boiler End by Washers.

This arrangement provides a friction drive between the Bush Wheel and the 1" Pulley, and the drive is transmitted through the gears to the output shaft. The

speed of the drive can be varied by sliding the 2½" Rod to move the 1" Pulley nearer to or further from the centre of the Bush Wheel. The

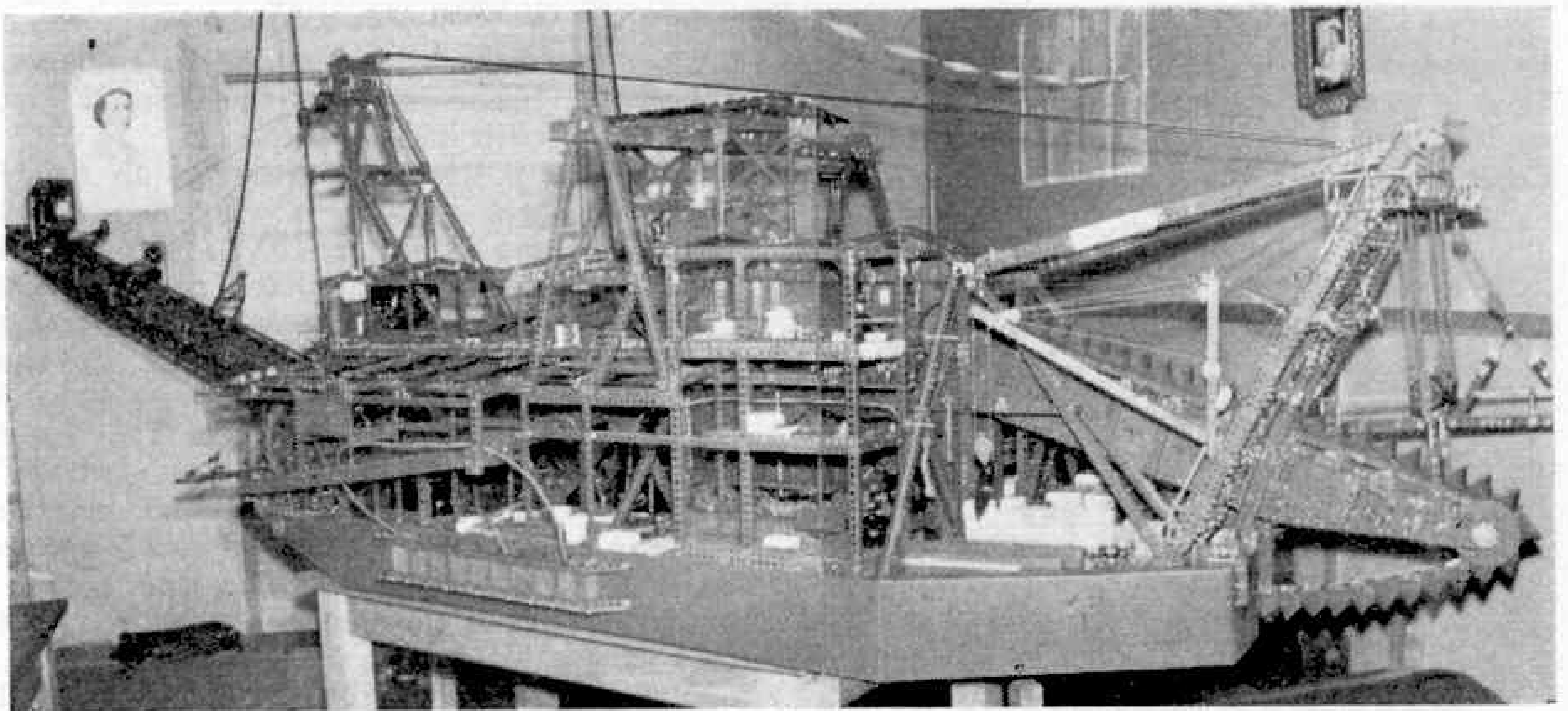


Fig. 3. The fine working model of a gold dredge built by Mr. B. J. Huffam, Ikamatua, New Zealand, mentioned in the notes on the opposite page.

sliding movement is controlled by a Centre Fork that engages between the Pinion 3 and a Collar on the $2\frac{1}{2}$ " Rod. Four Washers are placed on the shank of the Centre Fork, which is then inserted in a Coupling 5 but is not fixed in place. The Coupling is held on a 1" Rod mounted in two 1" Corner Brackets bolted to one of the 2" Strips.

Intermittent Drive

Some form of intermittent driving mechanism is required very often in Meccano model-building. For example, in machine tools of many kinds an intermittent feed is needed to move either a cutting tool or the material being machined after each working stroke. In this kind of arrangement the intermittent movement is comparatively small, and the mechanism shown in Fig. 4 is suitable for this type of work. The mechanism is gear driven and is therefore positive in operation, and with the arrangement illustrated the driven shaft turns approximately a quarter of a revolution in each intermittent movement.

The driving shaft 1 in the mechanism illustrated, is mounted in Angle Brackets bolted to a $3\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flanged Plate, and

carries a Worm 2. The Worm meshes with a 57-tooth Gear 3 that is freely mounted on the driven shaft, between a Collar and a $\frac{1}{2}$ " Pinion 4. A Coupling 5 is also free to turn on the output shaft and is held in place by a Collar. A $\frac{1}{2}$ " Pinion 6 is then fixed on a $1\frac{1}{2}$ " Rod supported in the Coupling and in a hole in the Gear 3.

As the Worm rotates the Gear 3 it carries round with it the Coupling and the Pinion 6. As the assembly turns the Pinion 6 is brought into mesh with the Worm for a short time during each revolution of the Gear, and drives the Pinion 4 fixed on the output shaft.

A Realistic Disc Wheel for Model Vehicles

The first step in making this wheel, seen in Fig. 5, is to place together two Semi-Circular Plates to cover the face of a 3" Pulley. Now place a Conical Disc over the assembly and insert four bolts through holes in the Semi-Circular Plates and the

Pulley. You will find that the bolt heads grip the edges of the Conical Disc and hold it firmly in place. A Wheel Flange can be used for a brake drum, but it must

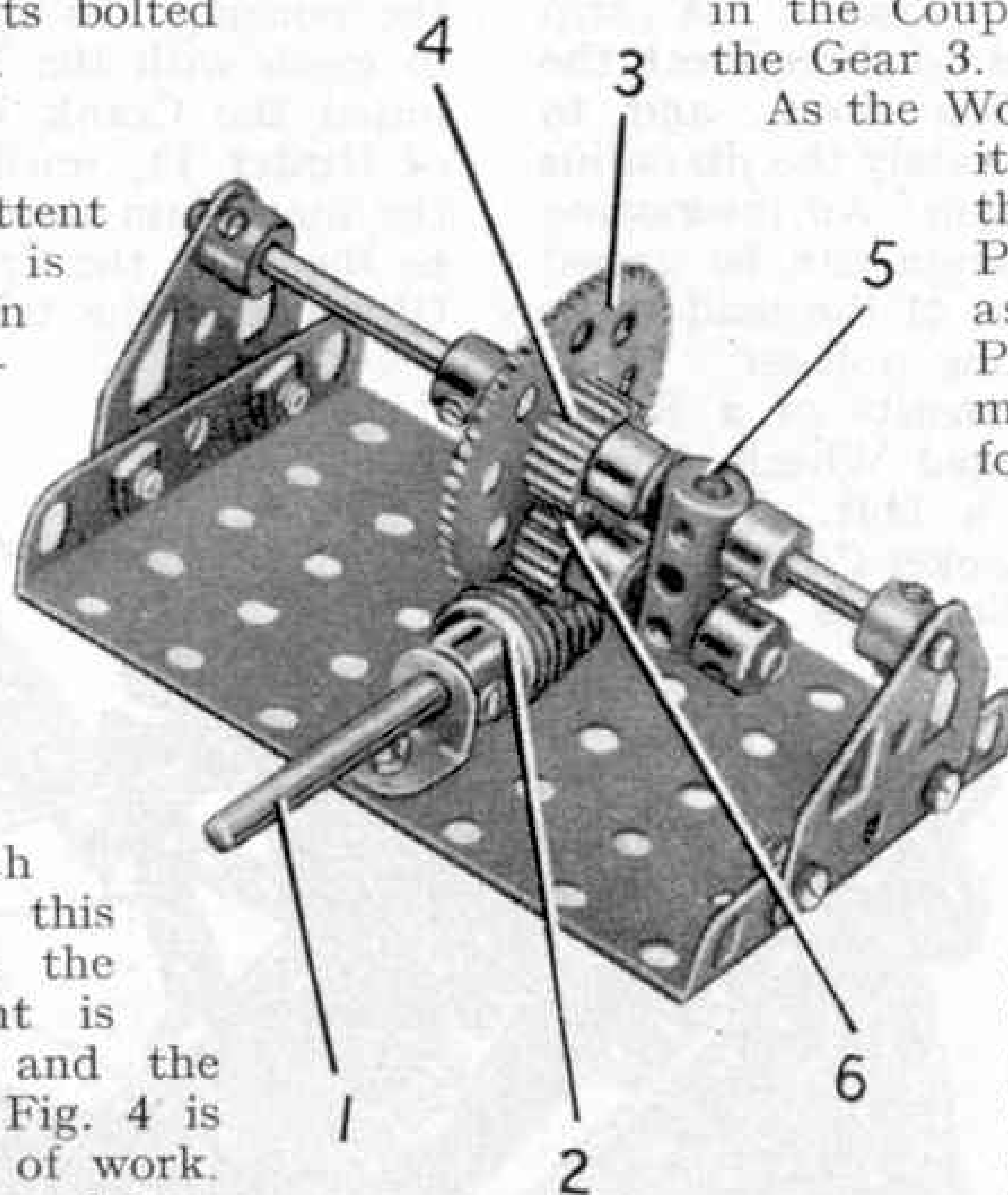


Fig. 4. This gear-operated intermittent motion mechanism is suitable for use in connection with the feed mechanisms of many models such as machine tools.

be spaced from the Pulley by Washers so that it clears the shanks of the bolts used to hold the Semi-Circular Plates and the Conical Disc in place.

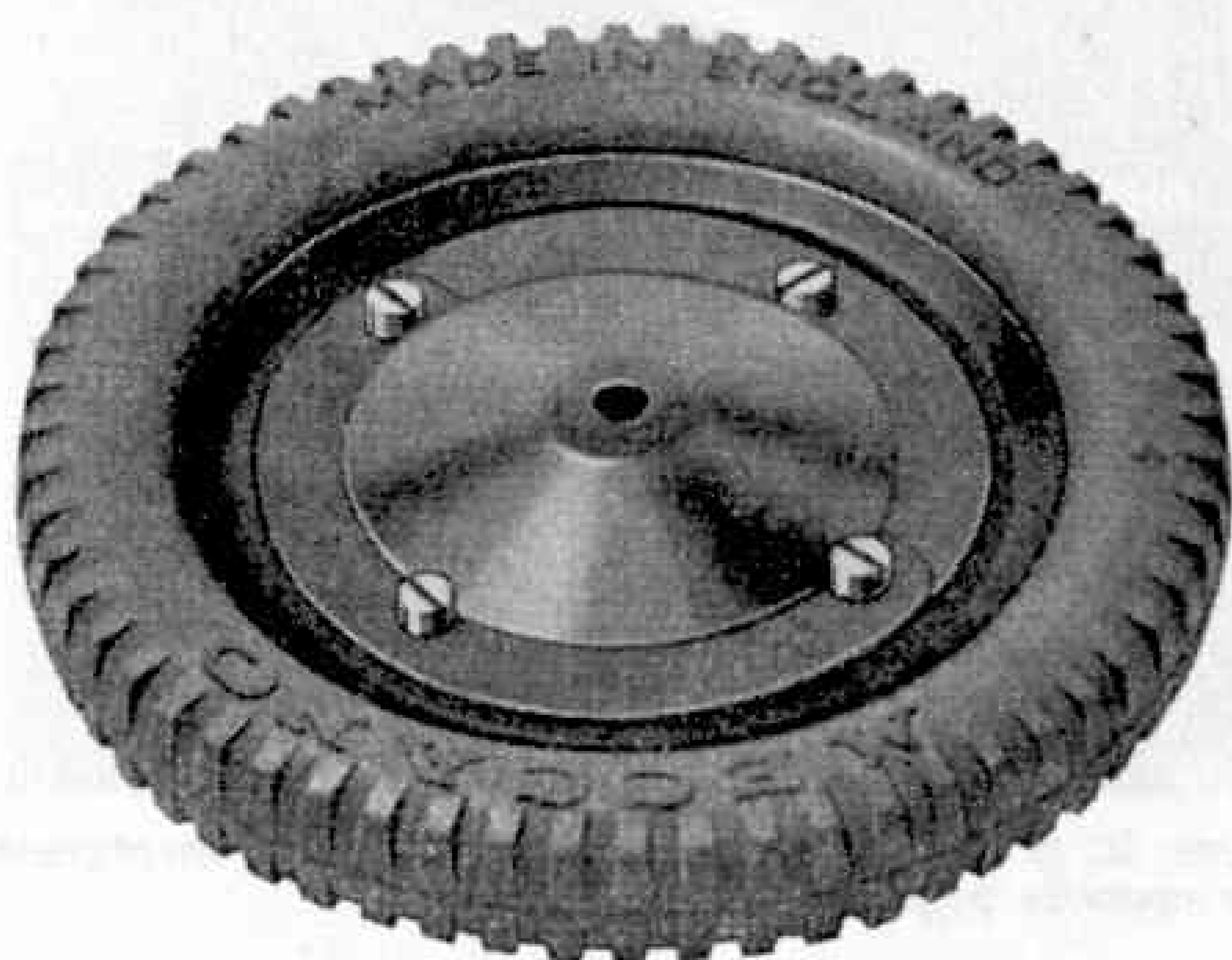


Fig. 5. A neat and realistic disc-type wheel for large model vehicles.

A Safety Device for Model Cranes

Fig. 6 shows an ingenious mechanical overload release mechanism designed specially for Meccano cranes. A trip mechanism is arranged to disconnect the drive to the jib luffing drum, and to brake the drum, immediately the jib radius exceeds the safety margin. An interesting feature is that this margin can be varied according to the weight of the load to be lifted, simply by moving a lever.

The luffing drum consists of a Sleeve Piece and two $\frac{3}{4}$ " Flanged Wheels, one of which is fitted with a bolt. This bolt slides in the slot of a Socket Coupling 1, and a Compression Spring is placed on the drum shaft between this Socket Coupling and the Flanged Wheel. A 57-tooth Gear 2 is held in the Socket Coupling, but the assembly must be free to slide on the drum shaft. Eight bolts in the Gear form part of the brake mechanism, and with the brake "on" they engage

further bolts in the mechanism housing. When the brake is "off" the Gear 2 just clears the teeth of a $\frac{1}{2}$ " Pinion 3.

A $4\frac{1}{2}$ " Strip 4 is lock-nutted to an Angle Bracket bolted to the jib, and to one end of a 2" Strip 5. Strip 5 is lock-nutted also to one arm of a Bell Crank, which pivots on a $\frac{3}{4}$ " Bolt attached to the side of the housing. The other arm of the Bell Crank is extended by a $2\frac{1}{2}$ " Strip 6 that forms the control lever. The lever moves in a quadrant made from two $2\frac{1}{2}$ " Stepped Curved Strips attached to the housing by $\frac{1}{2}$ " Bolts. A Slide Piece 7 pivots on a $\frac{3}{8}$ " Bolt passed through the arm 4, and slides freely over a $2\frac{1}{2}$ " Strip 8 bolted to a Crank fixed on a Rod 9.

The automatic trip is a Crank 10 on Rod 9, and this engages one end of a $3\frac{1}{2}$ " Angle Girder 11 lock-nutted to a Trunnion. The other end of Girder 11 carries a Threaded Pin that fits in the groove in the Socket Coupling 1.

Under normal operating conditions the Crank 10 presses against the Girder 11, and the Threaded Pin in the Girder holds the Socket Coupling 1 so that the bolts in the Gear 2 are clear of those in the side of the housing. In this position the Gear is in mesh with the Pinion 3. As the jib is luffed the Crank 10 slides over the face of Girder 11, until when the jib reaches the maximum radius for safety, according to the load, the Crank moves clear of the Girder and the trip mechanism operates.

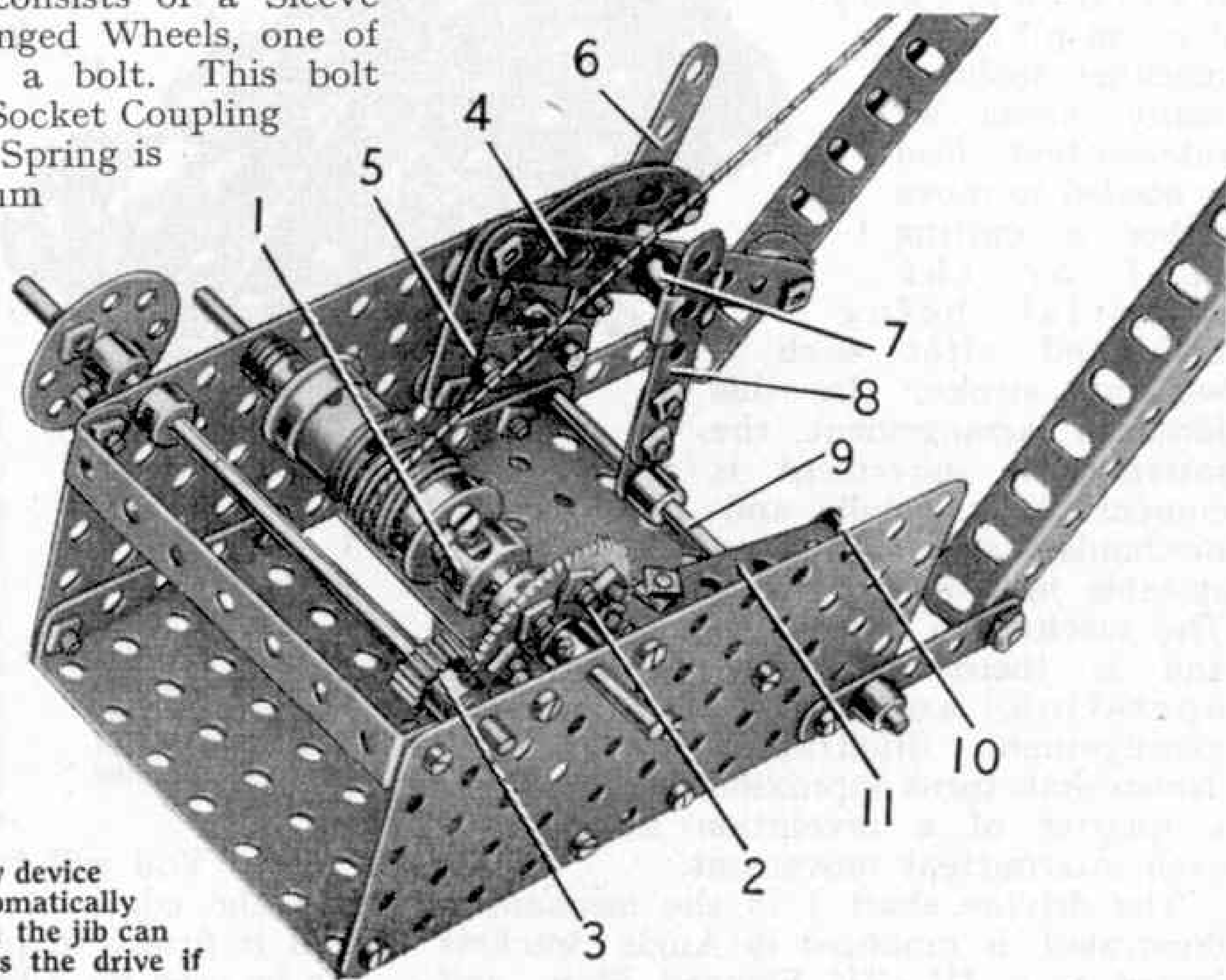


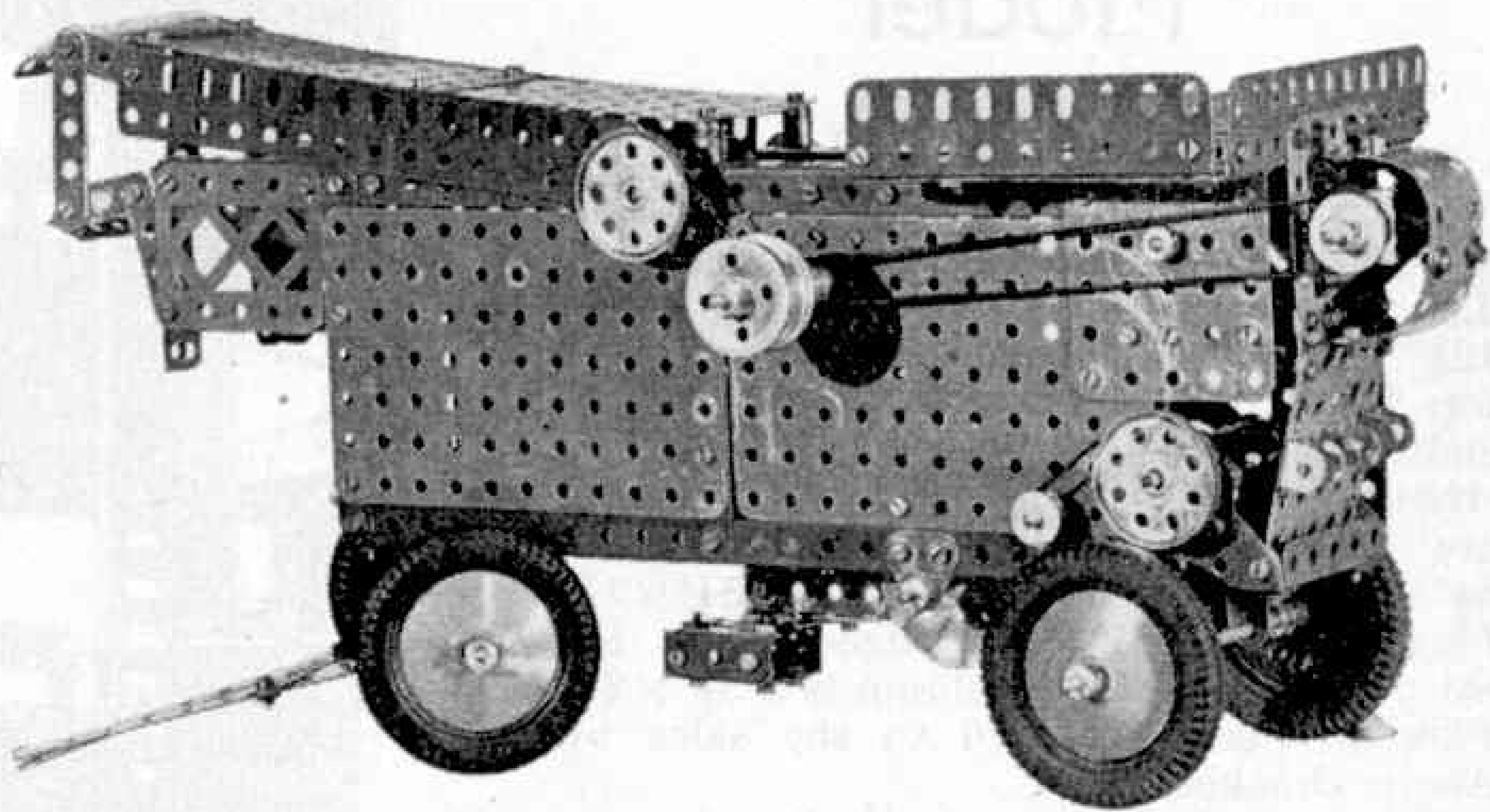
Fig. 6. This ingenious safety device for a model crane automatically controls the radius to which the jib can be lowered, and disconnects the drive if this radius is exceeded.

A Meccano Threshing Machine

M O D E L -
B U I L D E R S on the lookout for new ideas for future models will find many intriguing subjects in the wide range of machines used for agricultural purposes. Although most of these are suitable only for model-builders who possess either a large Outfit or a good stock of various parts, there are a few that come within the scope of the smaller Outfits.

Among the best examples of the more intricate agricultural machines is the threshing machine, and an excellent model of one of these is shown in the illustrations on this page. Many good models of this type have been built in Meccano, but for neatness and simplicity of construction it would be hard to find one more pleasing than that shown in our illustrations.

This model was built by Peter Lewis, Flamborough, a keen model-builder who has built many models of prize-winning standard. In it he has tried to incorporate all the main motions and functions of a real machine. First there is a threshing drum, driven from a main shaft. When the sheaves of corn are threshed, the

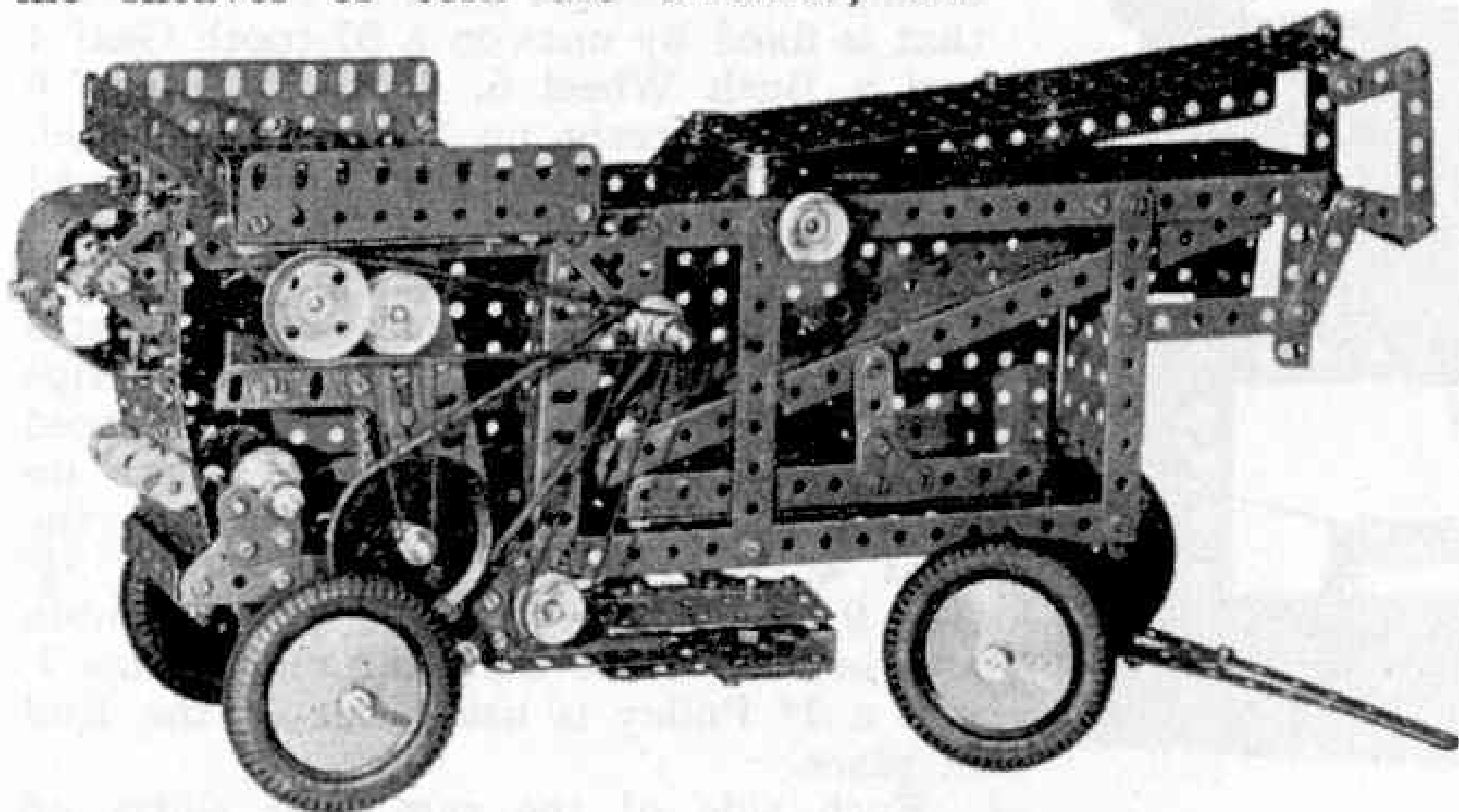


A fine model of a threshing machine built by Peter Lewis, Flamborough, some details of which are given on this page.

straw falls on to what are known as straw shakers, the vibrating motion of which shakes the straw out on to the ground. The odd bits of straw, which are called "ends," fall on to another shaking riddle which removes them from the machine. The grain and the chaff are then sorted, and the chaff is blown by a fan on to a chaff riddle that shakes it on to the ground.

Freed from chaff and straw, the grains are taken up by an elevator and carried to another conveyor in the form of a screw, which turns the grain to one side of the machine, where it falls on to a riddle that shakes it on to a rotating screening drum. The action of this is to separate the larger grains from the smaller ones.

From this point the grain passes down the discharge spouts, where it is collected in sacks, weighed and loaded into lorries for removal. The main shaft of the machine carries a pulley for driving a straw baler, and there is also a pulley for driving an elevator, which is arranged along one side of the corn shaker.



The threshing machine model with the plating of one side removed to show interior details.

New Meccano Model

Power Press

EACH side of the main column consists of two $12\frac{1}{2}$ " Angle Girders and three $12\frac{1}{2}$ " Strips. These are connected at the top by a $2\frac{1}{2}$ " Strip, and at their lower ends by a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate strengthened by two $5\frac{1}{2}"$ Strips. The sides are connected by bolting to them a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate 1, and two $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates 2 each edged by a $5\frac{1}{2}"$ Strip. The top of the column is a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate attached to the sides by Angle Brackets.

The rear of the base is filled in by one half of a Hinged Flat Plate extended by a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate. These parts are bolted to the Angle Girders of the main column. The front of the base is formed by the other half of the Hinged Flat Plate bolted to a horizontally placed $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate. The Plates are edged as shown in Fig. 1 by a $5\frac{1}{2}"$ and three $2\frac{1}{2}"$

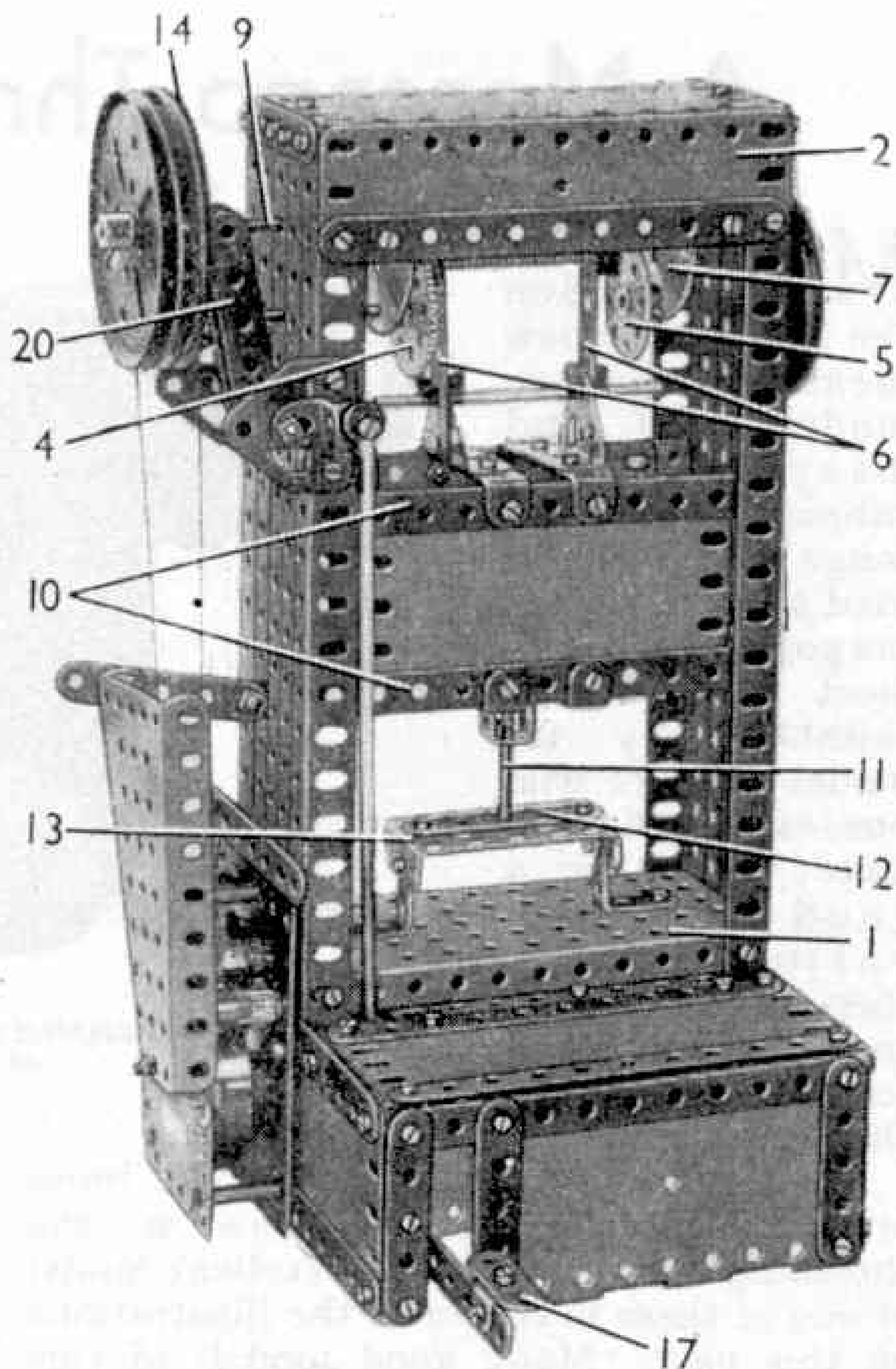


Fig. 1. A Power Press driven by a No. 1 Clockwork Motor and clutch controlled through a foot pedal.

Strips and the assembly is attached to Angle Brackets bolted to the sides. The top of the base is a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate and two $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates 3. The $5\frac{1}{2}" \times 2\frac{1}{2}"$ Plate is strengthened by two $5\frac{1}{2}"$ Strips and is connected to the sides by Angle Brackets.

The press is operated by a crank arrangement formed by a 3" Screwed Rod that is fixed by nuts on a 57-tooth Gear 4 and a Bush Wheel 5. Two $2\frac{1}{2}"$ Strips 6 are pivoted freely on the Screwed Rod. The Bush Wheel and the Gear are fixed on 2" Rods, each of which is mounted in one side of the column and in a Semi-Circular Plate 7. The Semi-Circular Plates are bolted to $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips fixed between the Plates 2, but spaced from these Plates by two Washers on each side. A $\frac{1}{2}"$ Pinion 8 engages the Gear 4. The Pinion is fixed on a $3\frac{1}{2}"$ Rod 9 mounted in one side of the column and in one of the Semi-Circular Plates 7, and a 1" Pulley is used to hold the Rod in place.

Each side of the ram that slides up and down the column consists of a $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate bolted centrally

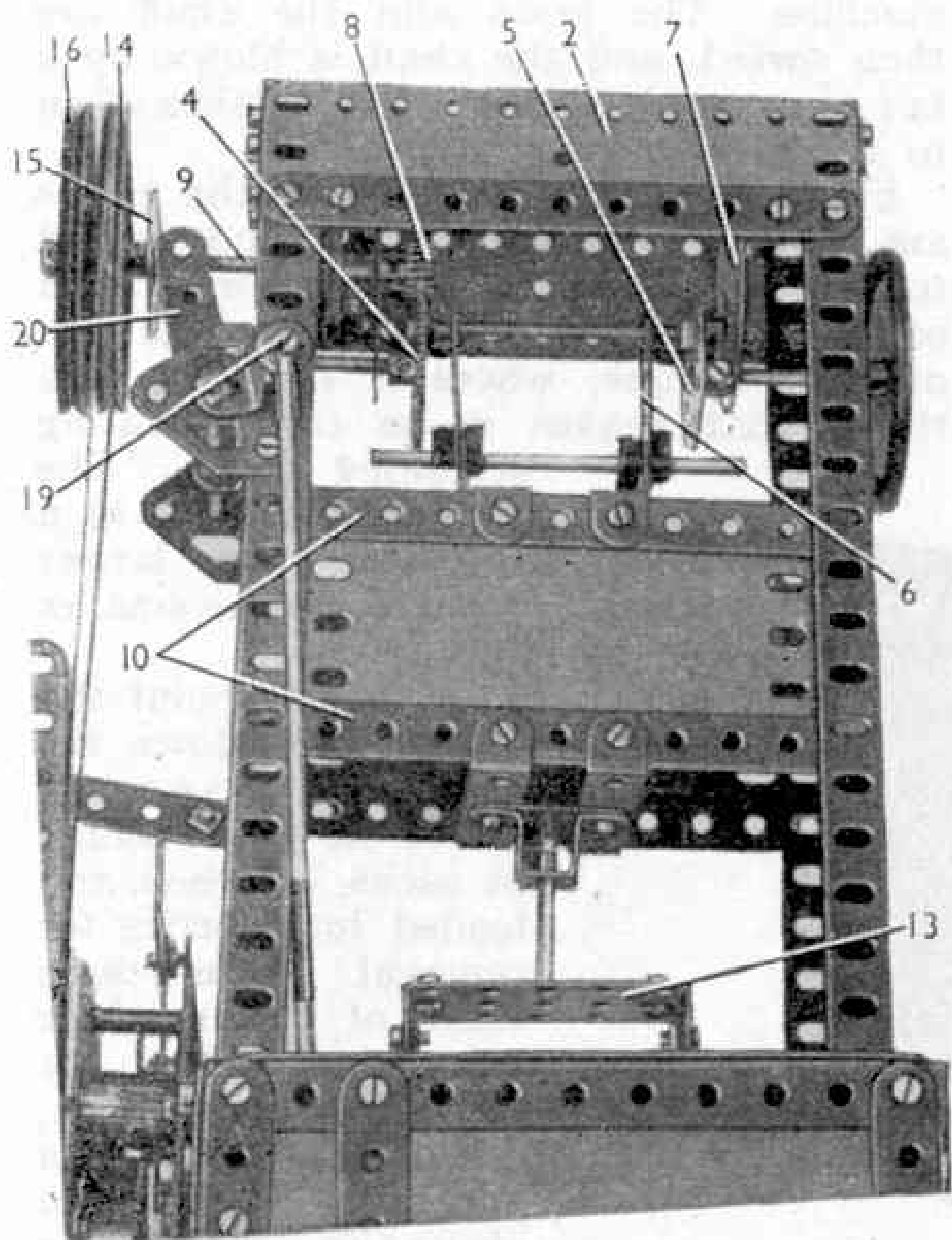


Fig. 2. The Power Press seen from the rear, showing the geared crank arrangement for operating the ram.

between two $5\frac{1}{2}$ " Strips 10. The sides are connected by four $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strips, the lower pair of which support a $1\frac{1}{2}$ " Strip and a Double Bent Strip together. A $3\frac{1}{2}$ " Rod 11 is held by Spring Clips

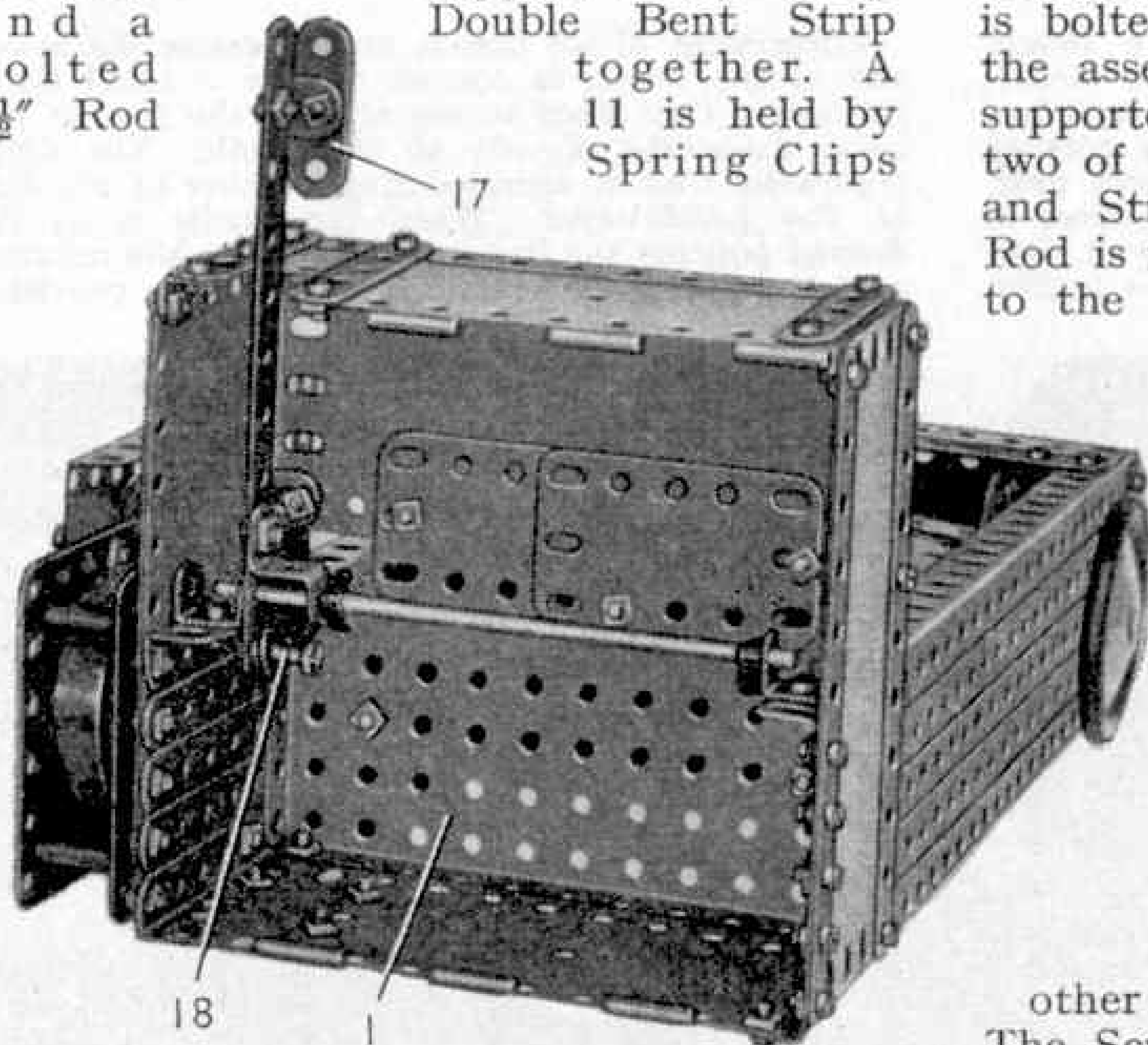


Fig. 3. An interior view of the base of the Power Press.

in the Strip and the Double Bent Strip, and represents the press tool. A Trunnion is bolted to each of the upper pair of Double Angle Strips, and a $3\frac{1}{2}$ " Rod is passed through these and through the next-to-end holes of the $2\frac{1}{2}$ " Strips 6. The Rod 11 must slide freely through the centre holes of a $2\frac{1}{2}$ " Strip 12 and a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flanged Plate 13. The Strip is spaced from the Flanged Plate by two Washers on each bolt, and the Flanged Plate is supported by two $1"$ \times $1"$ Angle Brackets bolted to the Flanged Plate 1.

A No. 1 Clockwork Motor is attached to one side of the base by two $\frac{3}{8}"$ Bolts, but is spaced from the base by nuts. A $1"$ Pulley fixed on the Motor driving shaft is connected by Cord to a $3"$ Pulley 14, which is free to turn on Rod 9. A Wheel Disc 15 is placed on the Rod next to the Pulley, and in addition the Rod carries a $3"$ Pulley 16 and a $1"$ loose Pulley fitted with a Motor Tyre. The loose Pulley is placed between the two $3"$ Pulleys 14 and 16, and forms part of a friction clutch assembly to transmit the drive from the Motor to Rod 9. When Pulley 14 is moved to the left (Fig. 1) it presses against the Tyre and the drive is engaged. When Pulley 14 is moved to the right it turns idly on Rod 9 and does not drive the press.

The clutch mechanism is controlled by a foot pedal 17 formed by a $5\frac{1}{2}"$ Strip and a $1\frac{1}{2}"$ Strip connected by an Angle Bracket. A $\frac{1}{2}"$ Reversed Angle Bracket is bolted to the $5\frac{1}{2}"$ Strip, (Fig. 3) and the assembly pivots freely on a $5"$ Rod supported in Double Brackets bolted to two of the main column Girders. A Rod and Strip Connector fitted with a $3\frac{1}{2}"$ Rod is mounted on a Pivot Bolt 18 fixed to the inner end of the $5\frac{1}{2}"$ Strip. The $3\frac{1}{2}"$ Rod is joined by a Rod Connector to a $5"$ Rod, and the latter is fitted with a Rod and Strip Connector that pivots on a $\frac{1}{2}"$ Bolt 19. Bolt 19 is attached by two nuts to a $\frac{1}{2}"$ Reversed Angle Bracket that is fixed by two nuts at one end of a $3"$ Screwed Rod.

The Screwed Rod is mounted in two Flat Trunnions bolted to the side of the column, and is held in position by two nuts screwed tightly against each other next to one of the Flat Trunnions. The Screwed Rod carries two $2\frac{1}{2}"$ Strips 20, each of which is fixed tightly in place by two nuts. These Strips bear against the face of the Wheel Disc 15. When the

(Continued on page 58)

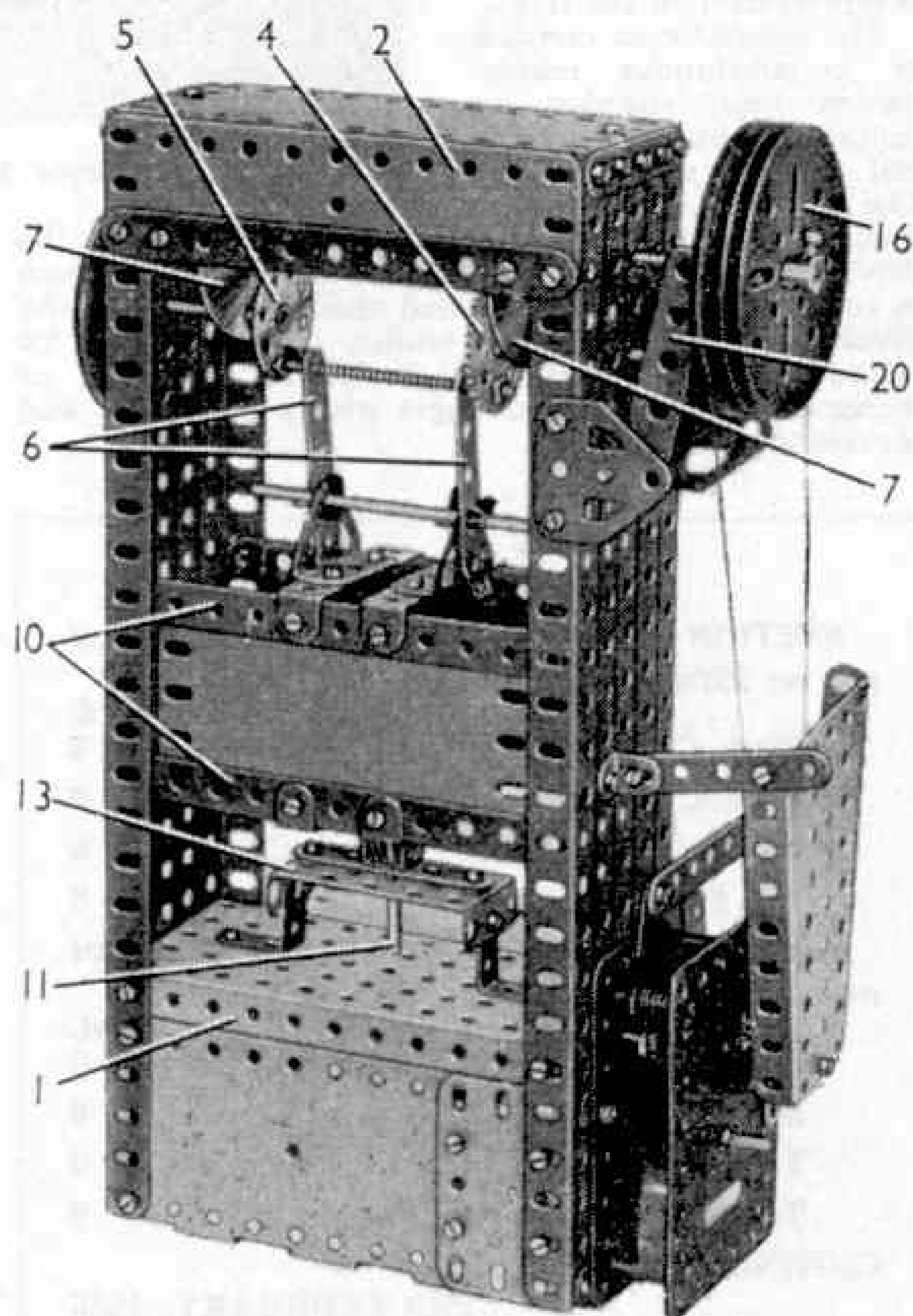


Fig. 4. Another view of the Power Press from the rear.

The LoadaVeyor Competition

DURING the last two or three weeks a steady stream of entries for The LoadaVeyor Model-Building Competition has been arriving at our Offices in Binns Road, and the stream is constantly growing as the closing date of the Competition draws near. Is your entry among those already safely received at Binns Road? If it isn't, you must get to work right away, for the last day for receipt of entries is 29th February.

Full details of The LoadaVeyor Competition have already appeared in the November and December issues of the *M.M.*, but for the benefit of new readers and others who did not see the earlier issues we are repeating the main particulars.

In entering this Competition competitors are invited to test their skill in making Meccano models of The LoadaVeyor, a light mobile load conveyor, manufactured by Messrs. J. Collis & Sons Ltd., London, who are joining with Meccano Ltd. in offering the fine Cash Prizes shown in the panel below for the best models received. A picture of The LoadaVeyor at work loading sacks on to a lorry is reproduced on the right.

The LoadaVeyor consists of a continuous motor-driven belt, running on rollers mounted in a light but sturdy metal boom. The boom is pivotally mounted near its lower end, which carries the driving motor, on a light tubular steel cradle, which in turn is pivoted on a wheeled chassis. Owing to the pivot arrangement of the cradle, the boom can be raised or lowered in the horizontal position, or inclined to any required angle within minimum and maximum limits.

Adjustment of the cradle, and therefore the heavy end of the boom, is carried out by a small Collis Hydraulic Unit fixed to the chassis, the ram of this being connected directly to the cradle. The Collis Hydraulic Unit is operated from a lever at one side of The LoadaVeyor. When the cradle is in the desired position the boom is adjusted to the required angle by hand. This is made easy by the provision



The LoadaVeyor at work, carrying sacks from a warehouse to a lorry.

of powerful counterbalance springs fixed to the underside of the boom. The motor that drives the belt is placed inside a casing at one end of the boom, and transmits its drive by sprockets and chain to the belt driving drum. The latter is mounted in such a manner that it can slide up and down to facilitate tensioning of the belt.

The LoadaVeyor can be supplied with different types of belts to suit the particular goods to be handled. For further details and pictures of The LoadaVeyor we must refer readers to the November and December 1955 issues of the *M.M.*, copies of which can be obtained from the Editorial Office, Binns Road, Liverpool 13.

Model-builders will not be able to reproduce the hydraulic mechanism of The LoadaVeyor in Meccano and they are free therefore to substitute screw, lever or any other kind of mechanism they can devise for the purpose of operating the cradle.

How to Send in Your Entry

Models can be built from any size of Outfit or number of parts and the Contest is open to readers of all ages. *The actual model must not be sent.* A good photograph or drawing only is required, and this must bear the competitor's name and address and the age he will be on 29th February next.

Entries will be divided into two Sections: A, for competitors under 15 years of age on 29th February 1956; B, for competitors 15 years of age or over on 29th February 1956.

Entries must be addressed: *The LoadaVeyor Competition, Meccano Ltd., Binns Road, Liverpool 13.*

THE PRIZES

SECTION A. (Competitors under 15 years of age on 29th February, 1956):

	£	s.	d.
First, Cheque for	10	0	0
Second, Cheque for	6	0	0
Third, Cheque for	4	0	0
Ten Prizes, each of a Cheque for	2	0	0

SECTION B. (Competitors 15 years of age or over on 29th February, 1956):

	£	s.	d.
First, Cheque for	15	0	0
Second, Cheque for	8	0	0
Third, Cheque for	5	0	0
Ten Prizes, each of a Cheque for	3	0	0

CLOSING DATE FOR ENTRIES—

29th FEBRUARY, 1956



Club and Branch News



WITH THE SECRETARY

MAKE THIS A YEAR OF PROGRESS

I wish all members of the Guild and H.R.C. a very happy and prosperous year in 1956. It can also be an outstanding year of progress in these organisations, and a good start can be made by every member resolving to bring into membership at least one new enthusiast.

Thanks to welcome Christmas gifts thousands of boys are now enjoying their first weeks as Meccano model-builders, Hornby Train or Hornby-Dublo operators. Some of them are certain to be known to Club or Branch members, and no time should be lost in inviting these newcomers to a meeting, in the hope that they will decide to become members. The more keen and bigger a Club or Branch becomes the greater can be its resources and the wider its contacts with parents and friends. In short, by its constructive activities it becomes a valuable influence for good in its locality.

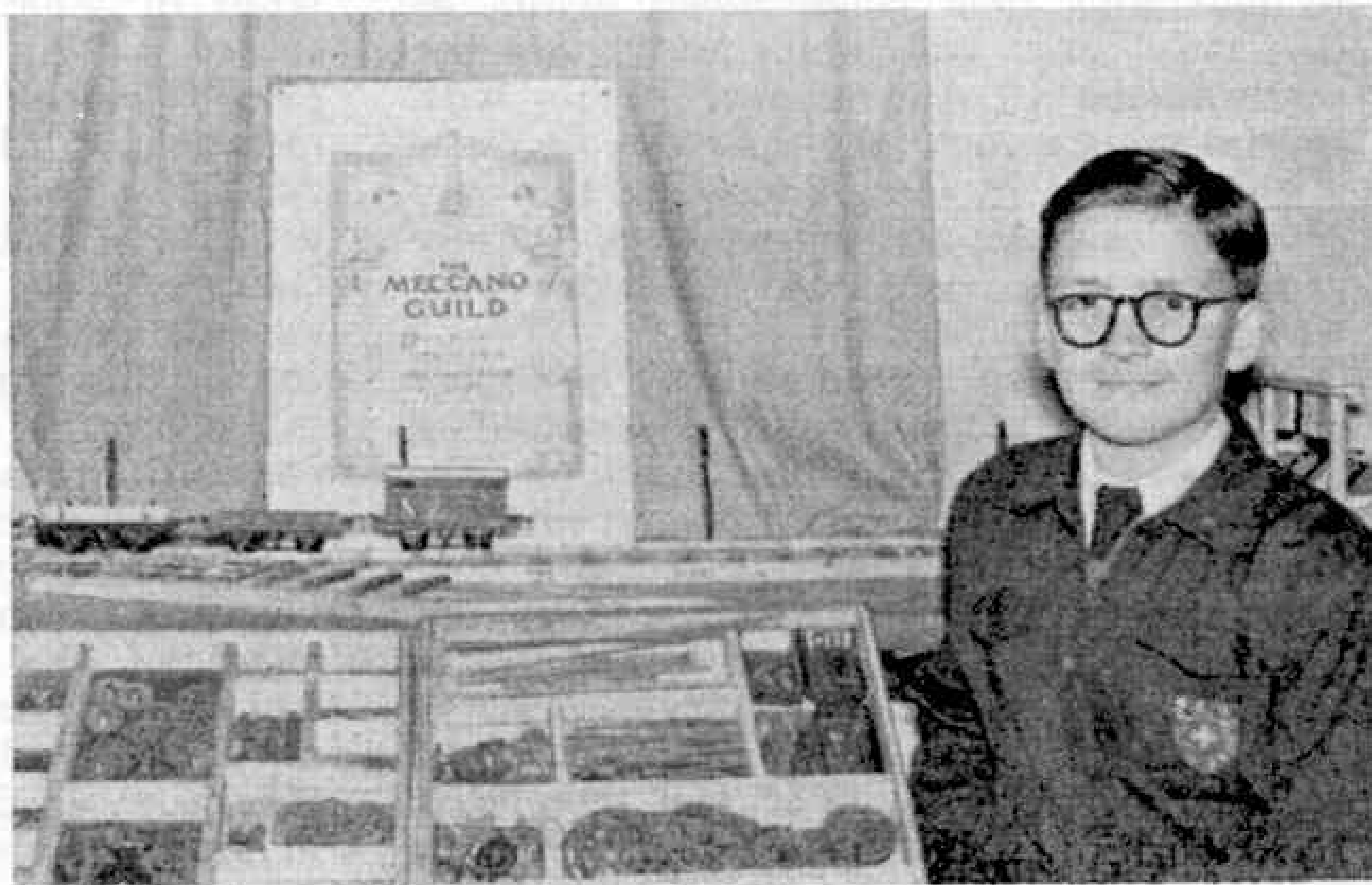
ADJUSTING THE PROGRAMME

The beginning of the new year is also an ideal time for Leaders and Chairmen to revise the Club or Branch programme in the light of members' reactions to it during the preceding Session. Certain types of programme may have proved to be much more popular than was expected, and others to have been rather a flop. The beginning of the second of the Winter Sessions provides an opportunity to bring the programme more into line with the desires of the membership.

MERIT MEDALLIONS

Next month I shall publish on this page the annual list of Merit Medallions awarded to Clubs during the past twelve months. There are many Clubs that have not fully availed themselves of this most useful award, and I hope that they will do so immediately so that I can both help them to give official recognition to the good work done by the members nominated to receive the Medallions, and also include these members' names in the February list. As mentioned previously, each Club is entitled to two Merit Medallions per Session.

J. Norman Barron, former Secretary of the Meccano Club associated with the Consett Y.M.C.A. He is one of the founder members of this now flourishing and enthusiastic Club, and it was his efforts that held the nucleus of the Club together until Mr. J. R. Goodrum took over the Leadership just prior to affiliation with the Meccano Guild in February 1954. Last year Mr. Barron was awarded the Guild Merit Medallion for his good services to the Club.



PROPOSED MECCANO CLUB

NORWICH—Mr. W. J. Rose, 88 Magpie Road, Norwich.

MECCANO CLUB RECENTLY AFFILIATED

KOTA (INDIA) M.C.—Leader, Mr. S. L. Chablani, Kota (Raj), India.

CLUB NOTES

NEWTOWN SCHOOL (WATERFORD) M.C.—More new members have been enrolled. Plans are in hand for a visit to a local iron foundry. Club roll: 13. *Secretary*: L. Lynn, 26 Fitzwilliam Square, Dublin, Eire.

ST. THOMAS AND DISTRICT (EXETER) M.C.—The Club continues to make steady progress, with Meccano model-building the main activity. Excellent models completed recently have included various types of scales and a sundial. A second and junior football team has been formed, named *Juventus Meccano*. *Secretary*: D. Morgan, 33 Cowick Road, Exeter.

HORNSEA M.C.—In recent voting competition Meccano model-building gained the largest number of votes, with film shows and games running second and third respectively. One member is constructing a Meccano windmill that will be operated by a clockwork motor. *Secretary*: A. Ings, Carlton Lodge, Cliff Road, Hornsea.

BRANCH NEWS

ABBNEYFIELD ROAD (SHEFFIELD)—The present Branch year began with a meeting on Saturday, 1st October last, and subsequent meetings have been held on alternate Saturday mornings at 11.0 a.m. At recent meetings excellent track running has been carried out, and plans are being made to extend the Branch layout. New members will be welcomed. *Secretary*: R. North, 132 Abbeyfield Road, Pitsmoor, Sheffield 4.

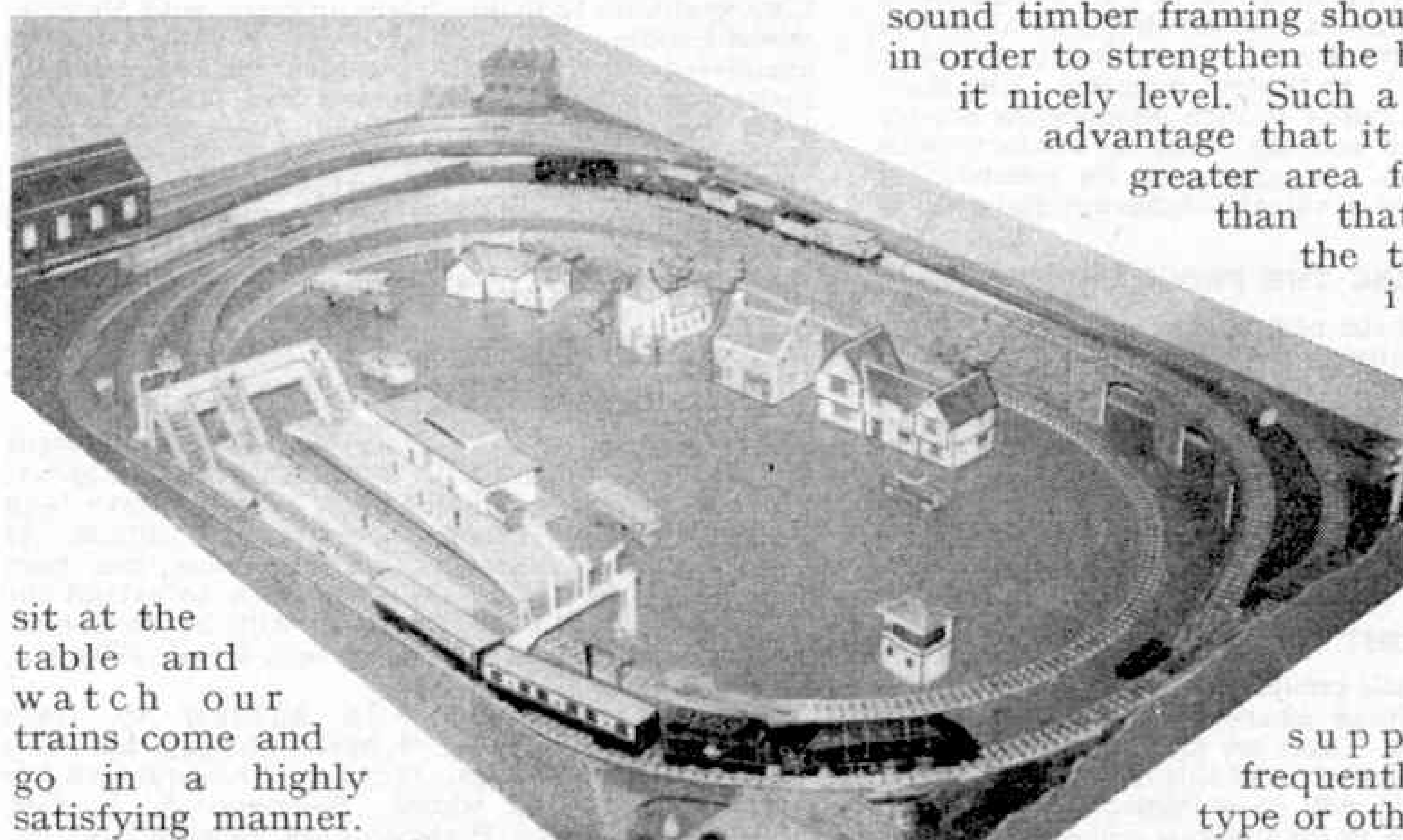
HALE END (LONDON)—In addition to track operations, a good deal of model-building has been done at recent meetings. It is hoped to arrange a few outings during the winter. *Secretary*: A. L. Coe, 463 Hale End Road, Highams Park, London E.4.

EDLINGTON COUNTY SECONDARY SCHOOL—The Branch track, locomotives and rolling stock have been thoroughly overhauled. Track operations have been enjoyed. *Secretary*: P. Nichols, 23 Thompsons Avenue, Edlington, nr. Doncaster.

HORNBY RAILWAY COMPANY

By the Secretary

MANY Hornby-Dublo trains make their first journeys on the simple oval track that is contained in each Hornby-Dublo Train Set, and this little layout usually makes its appearance either on the table or the floor. The table is the better place because it provides a nice level site, and it raises the railway to a convenient height for handling. We can



sit at the table and watch our trains come and go in a highly satisfying manner.

If we cannot use the table, then we begin on the floor; and here we must watch that the space we can use is as level as possible. The rails should not be made to climb from carpet to mat and then come down again, as this may upset rail joints and affect the performance of the trains. Still, with careful management the floor can be quite a good place; in fact it may be the only place we can use, so then we have literally "to get down to things" in the best way we can.

The expansion of the railway is almost an inevitable step, because of course we want to make the best use of the possibilities of our equipment and so improve our railwaying. Here the floor can score over the table as a site for our railway, because of the space it gives us, although our tracks may have to avoid certain items in the room that must be regarded as fixtures. The fact, too, that the door must be opened must not be

Table, Floor or Baseboard?

overlooked, otherwise there may be a sudden interruption of the train service when another member of the family suddenly walks in!

A separate baseboard is really better than the table or the floor and the Hornby-Dublo owner who goes in for a baseboard will either make it himself or have it made to his requirements. Whatever the material, it is essential that sound timber framing should be provided in order to strengthen the board and keep it nicely level. Such a board has the advantage that it can provide a greater area for the railway than that afforded by the table on which it may be

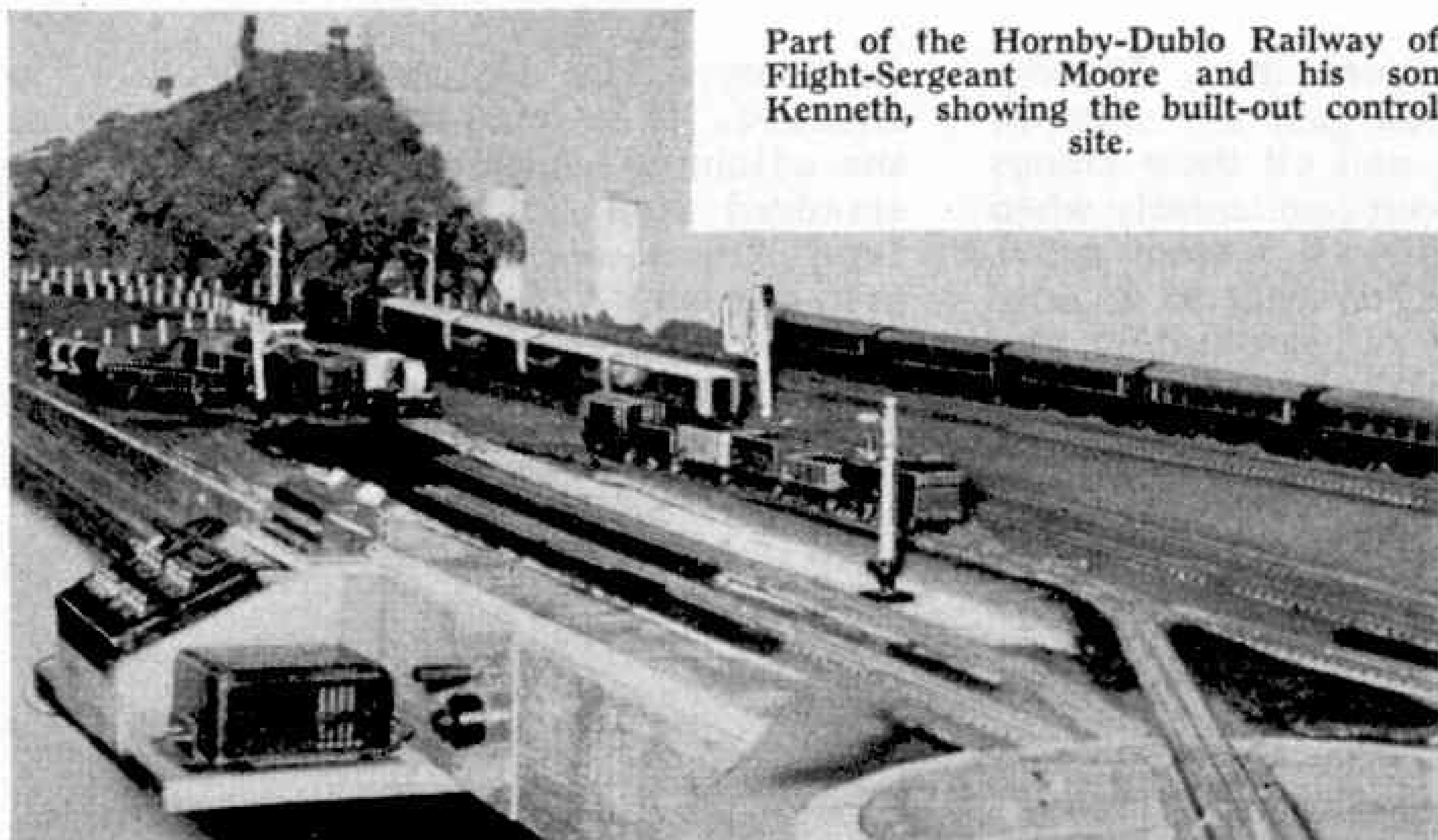
An effective baseboard layout operated by H.R.C. member Richard Simpson. Photograph by R. L. Adams.

supported; but frequently special trestle type or other supports are arranged, the idea being that when it is not in use the railway and its effects can be stowed away.

This month our illustrations are of special interest from the layout baseboard point of view. In the picture above is shown a very good example of the one-piece type of board which carries the railway of Richard Simpson (H.R.C. 245392). This is 6 ft. long and 4 ft. wide and has been built up for him by his Grandfather, Mr. F. W. Morris. The general scheme of the railway is that continuous running is possible with two main tracks and an outer loop, with connecting tracks joining all three. The outermost track and its extension, which forms one of the connecting lines, incorporate gradients, and the general effect of the "fly-over" section at one end of the board is quite pleasing. Richard himself has done a great deal towards the railway. Several buildings are of his making, as also are the stations.

In the second illustration we move to Singapore, where Flight-Sergeant D. Moore and his son Kenneth have a well-arranged Hornby-Dublo system on a shelf-type

arrangement of these is shown by the dotted lines. The main upper section, carrying a concentration of loop lines and sidings, with plentiful provision of



Part of the Hornby-Dublo Railway of Flight-Sergeant Moore and his son Kenneth, showing the built-out control site.

Uncoupling Rails, is 7 ft. 6 in. long by 2 ft. 3 in. wide. All the electric wiring is underneath this board and passes through the cross battens where necessary.

The lower main section is 1 ft. 3 in. wide only. The end boards each measure 5 ft. 6 in. by 1 ft. 6 in. Each of the sections consists of sound plywood laid on a framing of battens that

baseboard of the more or less permanent kind. This follows the old favourite scheme of running along the wall, in this case of the verandah, the width of the board depending on the number of tracks at any given point. Control gear is placed off the baseboard proper, a built-out extension being made to accommodate it in a clean and compact manner. From this control point the operator has a good view of the line, which stretches away from him on either hand, with a return loop concealed at each end. So continuous running is afforded, without the fact being obvious.

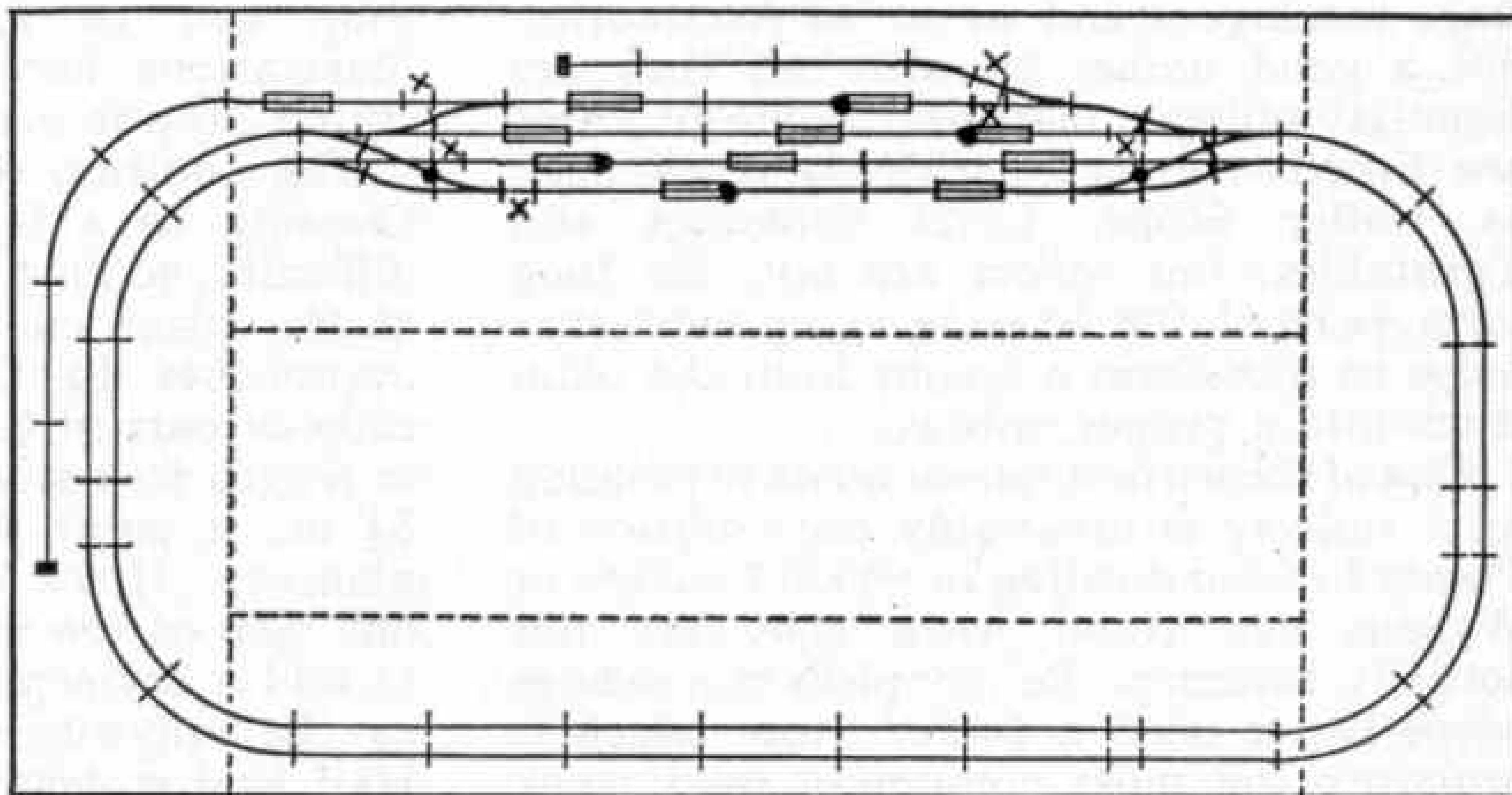
A well-planned railway arranged on sectional baseboards is that developed by Rev. J. F. Capper, a plan of whose system appears in the lower illustration on this page. Here the arrangements have been very well thought out, so that the railway could be stored away when not in use. The base of the system consists of four sections, and the

run along the edges, with additional cross-members connecting them.

The jointing of the boards is made by dowels in the end boards, which fit into corresponding holes in the other boards. The rigidity of the system depends on these dowels and not on those rails that bridge the joints. These rails are removed when the railway is taken apart, so there are no rails projecting beyond the edge of any of the boards, an important point when a layout has to be stored.

The layout itself was planned with special reference to the train movements to be carried out, the main upper section with its concentration of loops and sidings forming a marshalling, despatch and reception centre. The rest of the track is plain double main line well suited to fast long-distance running.

The 10 ft. 6 in. by 5 ft. 6 in. Hornby-Dublo layout arranged on a sectional baseboard by the Rev. J. F. Capper. The Isolating Rails are marked "X" and the black circles indicate Insulating Tabs. The rectangles are Uncoupling Rails.



Railway Necessities

Additions for Simple Hornby Railways

THERE is much more in a Hornby railway system than just the rails on which the trains run, and all these things have to be thought about particularly when making a Hornby railway system grow. This is something all of us want to do once we start the Hornby railway hobby, and almost always we think in terms of the track layout. That is good, for track improvement and extension do form an essential part of development schemes and naturally special attention must therefore be given to this part of the job. This is particularly so when the owner of

A Hornby No. 50 Locomotive and Tender on the Turntable in the "Locomotive Yard." The No. 2 Turntable can serve eight radiating tracks.

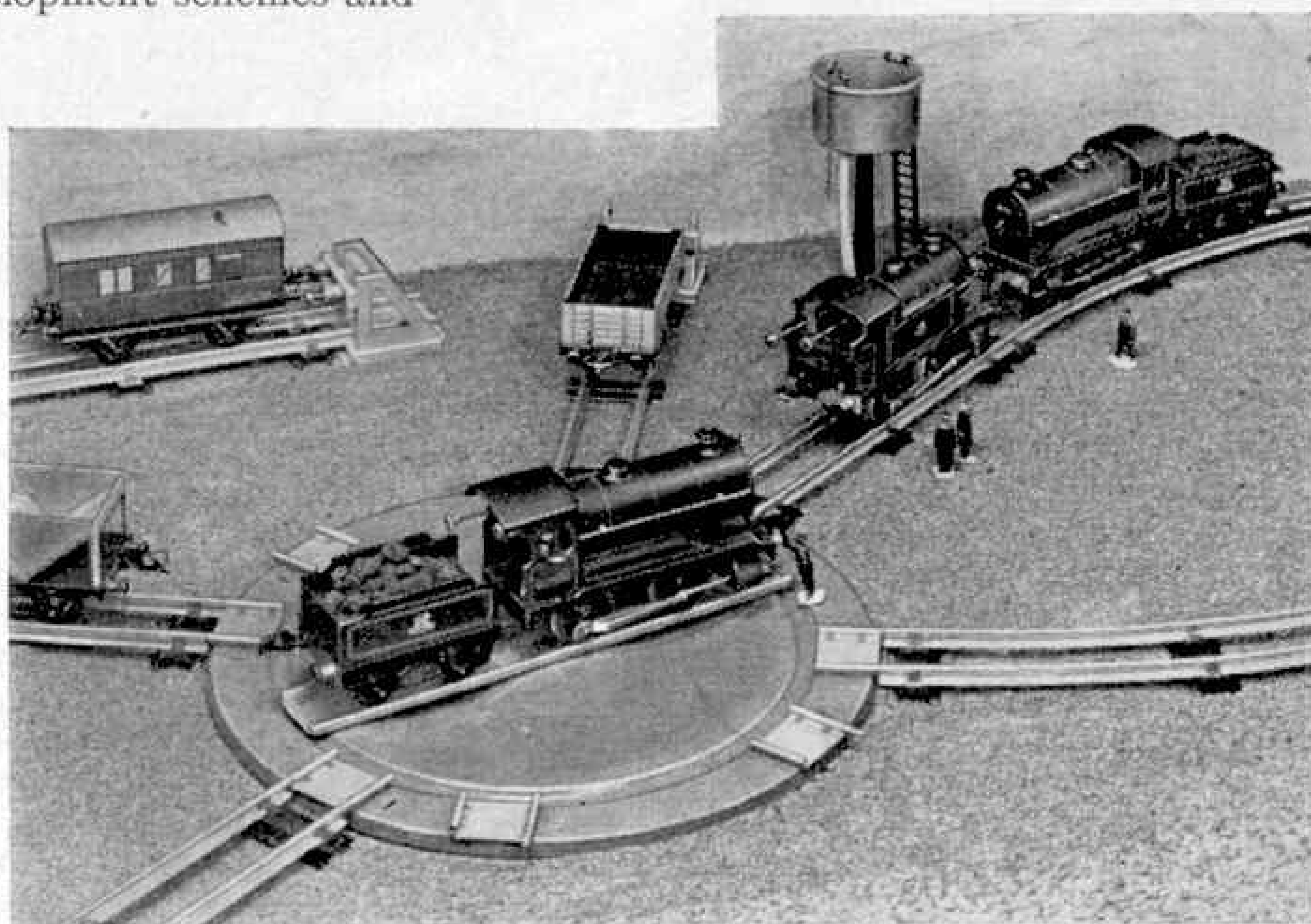
a layout is at the stage of experimenting with various systems in order to try out their running possibilities and so on. But an eye must be kept on other possibilities that open up fine fields for operations,

These concern all the different items that are described in a general sense, in Hornby train catalogues and so on, as Accessories, not a good name, for after all they are essential railway features. Some of these are directly connected with the track, such as Buffer Stops, Level Crossings and Turntables; but others are not, for they form part of the lineside equipment that helps to transform a layout from the plain track into a proper railway.

One of the earliest moves made in building up a railway is invariably the addition of Points to form a siding in which Coaches or Wagons can stand when they are not actually running. To complete the sidings properly we need a Buffer Stop, which is probably the most commonly used track

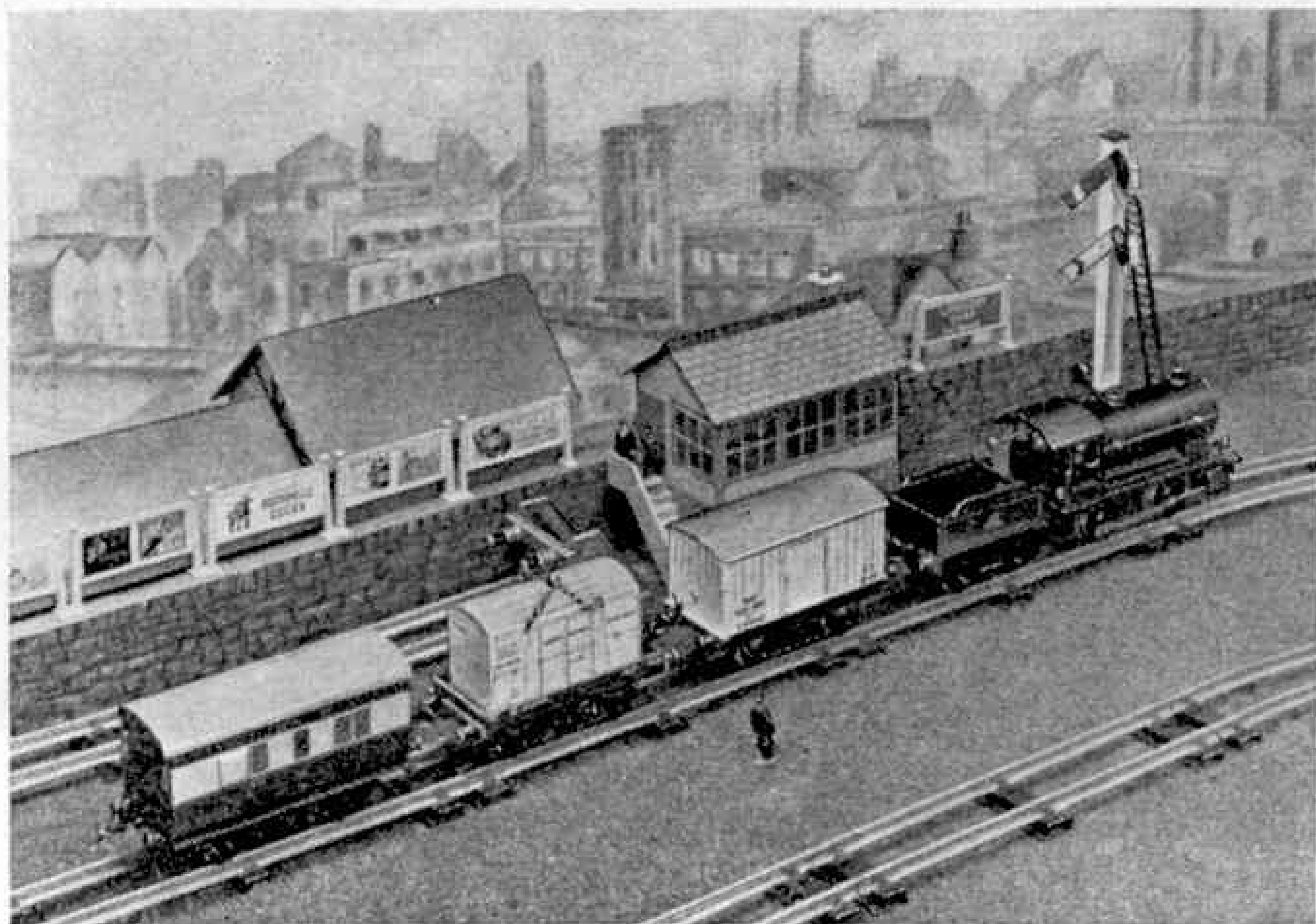
accessory. The Hornby Buffer Stop is effective. It is intended to be secured to the adjoining length of rail by means of a standard Rail Connecting Plate. Spring type buffers are fitted and add to the attractiveness of this useful piece of equipment.

Those keen on track planning will probably be interested to know that the



rails incorporated in the base of the Buffer Stop correspond in length to the standard Straight Quarter Rail, which is $2\frac{9}{16}$ in. long, not counting the rail joint pin. Some idea of the essential character of the Buffer Stop can be gathered from all three illustrations here; there is at least one Buffer Stop in each of them.

The addition of a Hornby No. 1 Level Crossing to a layout design presents no difficulty, so long as there is sufficient space at the place chosen for the sloping road approaches to the crossing gates. The railway part of the Level Crossing is equal in length to a standard Straight Half Rail, $5\frac{1}{8}$ in., a point that will interest the rail planners. If we add a Level Crossing to one side of the usual oval track, we have to add a corresponding Straight Half Rail to the opposite side. And this Straight Half Rail is, ready for use, packed in with



The Signal Cabin is an essential lineside feature and here a short special freight train has a clear road past the box.

useful then, but to ensure that a tender engine is the right way round for main line running we must have some means of turning at the end of the journey. The Hornby Turntable is simple, but effective. As you will see from the illustration on the opposite page, it has a number of short pieces of track attached to the outer edge of the base.

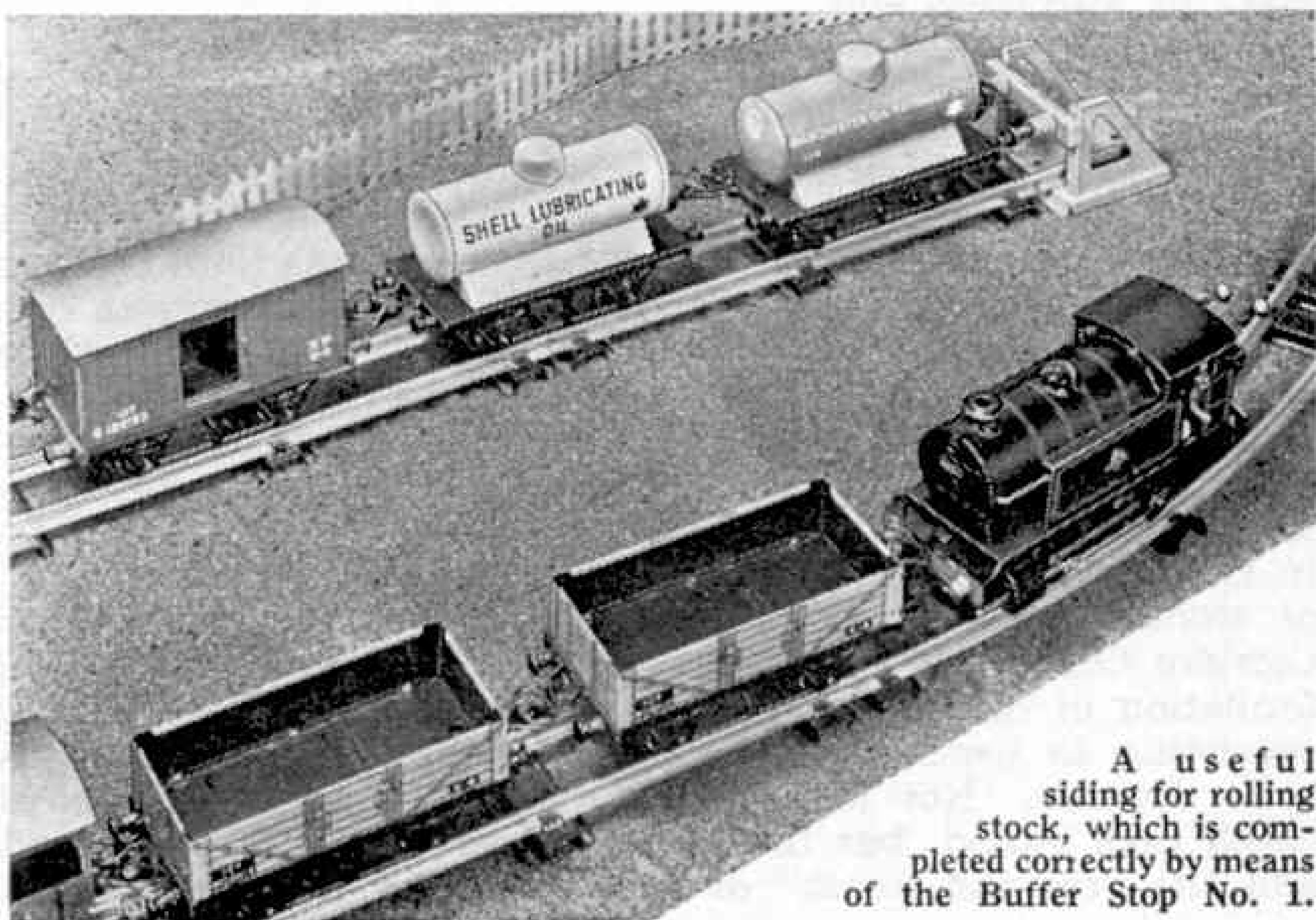
These make it possible for radiating tracks to be connected round the Turntable.

Using the Turntable is good fun and the Hornby railway owner can be sure that he enjoys this more than any real enginemen who may still have to turn their locomotives by hand. Like real turntables, however, the radiating part of the Hornby Turntable has a locking device that holds the track firmly in line with any of the radiating tracks. Before running an engine on to the Turntable the Hornby engineman must see that the table is locked in the correct position. Then when the engine is nicely accommodated on the table the brake is applied, the locking device undone and the table revolved slowly by hand.

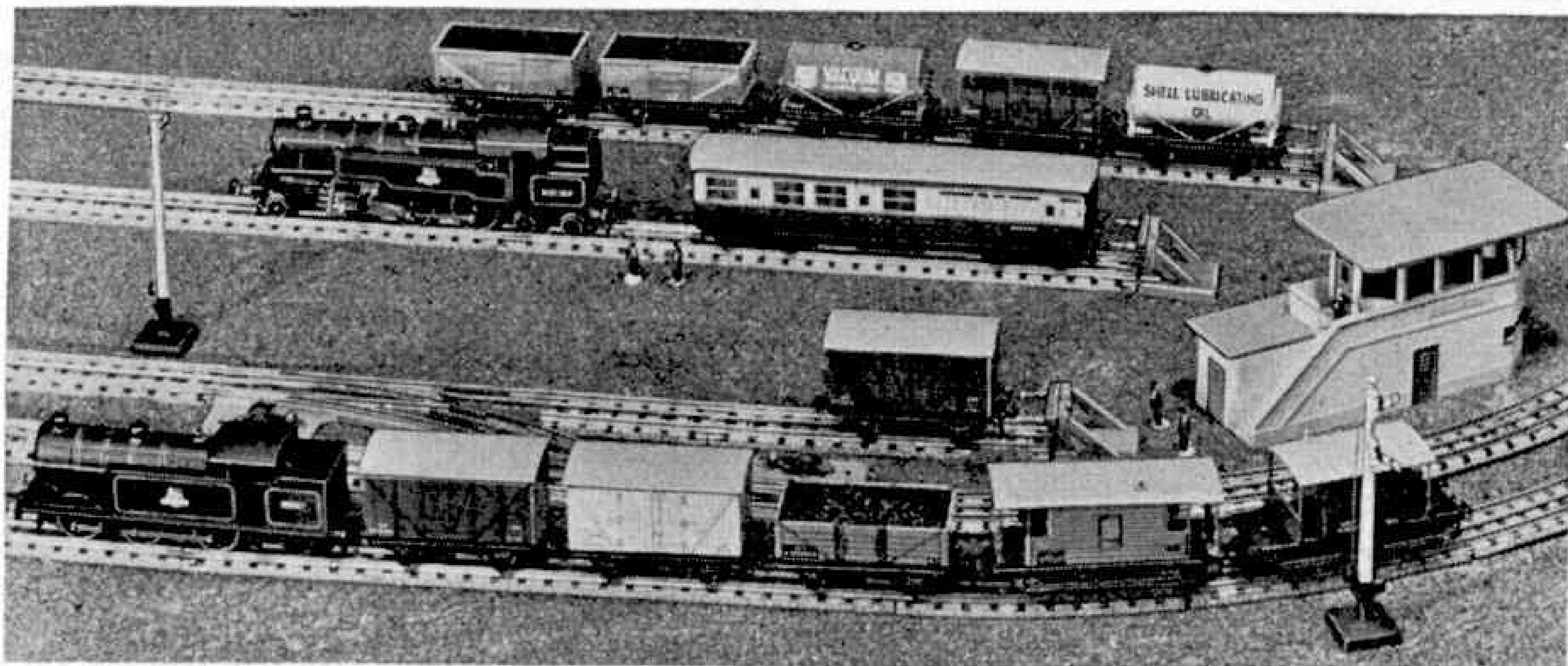
the Level Crossing, a convenient feature that the Hornby railway owner will appreciate.

When installing a Level Crossing we should bear in mind the precise purpose of this piece of equipment. A real level crossing allows railway and road to intersect on the level, the gates being provided for the protection of road users, either on foot or a wheel. So we should therefore suggest the presence of a road to lead up to and away from the miniature Crossing itself. Even the presence of one or two road vehicles—Dinky Toys, of course—and possibly several miniature Figures will help matters. On a layout arranged temporarily on the floor anything more elaborate will probably not be possible. The owner of a permanent line can usually feature a roadway in a satisfactory manner, as long as he has sufficient space for this on his baseboard.

A Turntable is a useful addition to a Hornby railway and it is considered essential by those who give special attention to the L o c o m o t i v e Department of their railways. A Turntable is not really needed where tank engines only are employed, although it can be



A useful siding for rolling stock, which is completed correctly by means of the Buffer Stop No. 1.



Mixed Trains and Marshalling

ON our Hornby-Dublo layouts all of us like to run a well ordered service of trains. It is good to operate passenger services, with trains correctly made up with the proper vehicles. On the goods side of things there is more variety, but the more important regular freighters will probably consist of a regular rake of Vans owing to the nature of the traffic that is dealt with.

Now more varied loads mean more fun, as we have often pointed out, and this does not mean only that a greater variety of rolling stock should be employed. We should always be keen to discover different ways of arranging and running the vehicles that we already have in service.

At times business may become brisker in the passenger department of a Hornby-Dublo Railway, and it is then good fun to add an extra coach to the regular formation of one or other of our trains to accommodate the extra passengers. This may not necessarily be of the same type as the vehicles in the regular make up. Indeed, if it is different it helps to emphasise the reason for its addition, which has led to the use of the handiest available piece of stock. For instance, we may add a Corridor Coach D11 or D12 to the regular formation of one of our suburban trains, consisting as usual of D13 compartment type Coaches. Not only is the type of coach then varied, but the livery as well, and the "red-and-cream" of the corridor

type addition gives a pleasantly "different" air to the train. This sort of thing does occur in real life, and there is every reason for making it happen on a Hornby-Dublo railway.

A regular feature of real railway working is the running of what are known as stock trains. These consist of coaches that are being run either to or from the carriage works for attention, or of empties being moved to provide a supply of vehicles somewhere or other for additional services

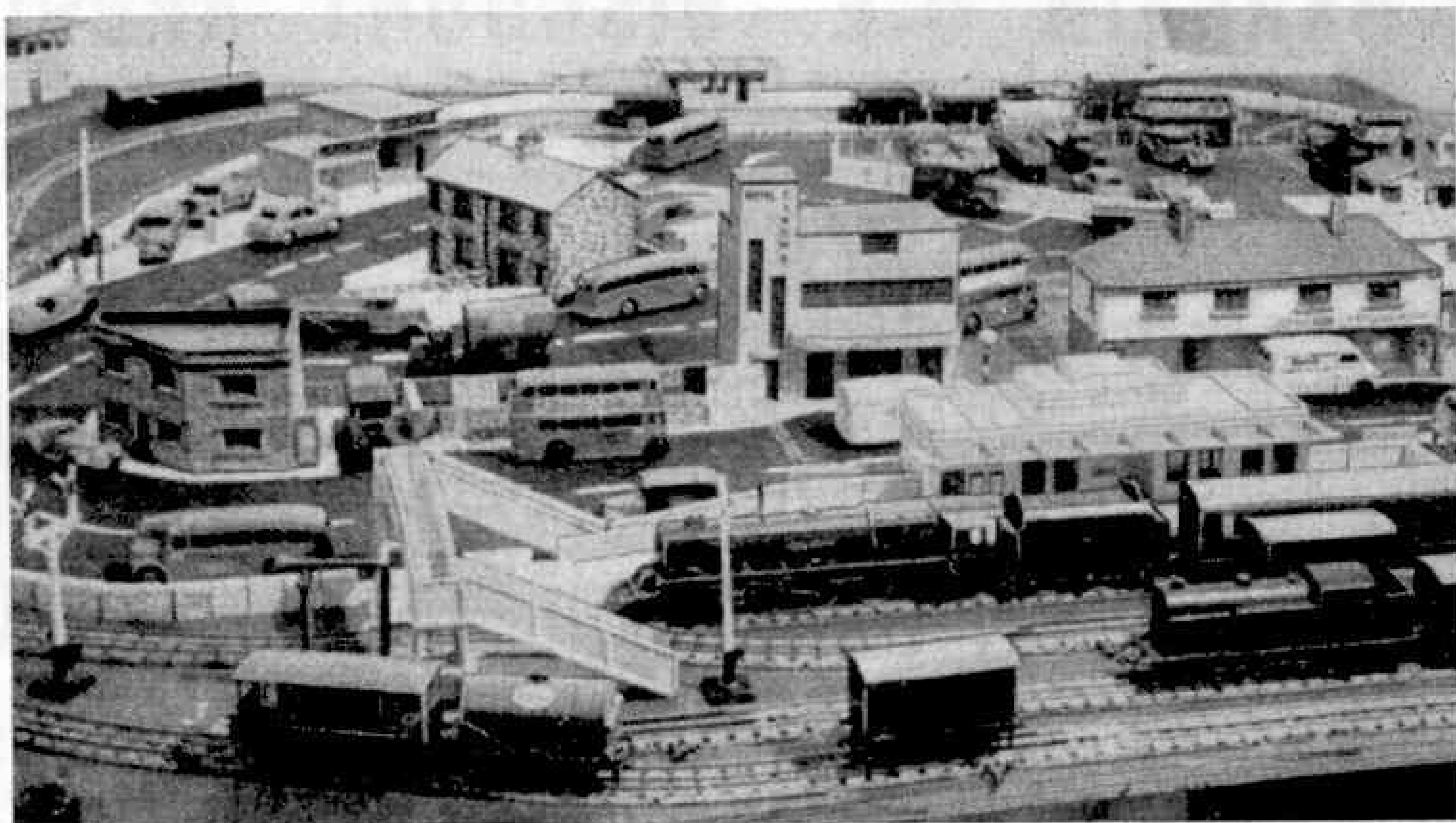
or to meet some special need. Such trains can consist of a really good variety of vehicles, and the combinations observed at different times can be quite entertaining.

We can do this in Hornby-Dublo now and again, possibly as the last main line move of a spell of working. A certain amount of sorting out of Coaches from the lines where they finished duty may be necessary in order to have them ready at the right place for the next running session. Some interesting movements indeed can be worked out to get the Coaches into order so that they can readily be disposed of where required.

In carrying out all the workings mentioned, from the attachment of additional vehicles to the distribution of Coaches ready for the next "round," it is of special advantage to have Hornby-Dublo Electrically Operated Points—and Signals too—and the Electrically-Operated Uncoupling Rail. Several of each will

The scene at the head of the page shows a short mixed freight train on a Hornby-Dublo Railway. This includes two Goods Brake Vans, one of which is merely being worked down the line.

General view of the layout of Philip Slotkin, showing Lichfield Station in the foreground.



be necessary on most layouts and the places for Uncoupling Rails relative to the Points should be studied carefully with an eye on the movements to be carried out. There is

no harm in repeating this familiar advice.

The position of the Uncoupling Rails and Points, whether Electrically Operated or not, can influence greatly the success or otherwise of our operations. The importance of this is well recognised by the owner of the layout that appears in the upper illustration on this page. He is *M.M.* reader Philip Slotkin, of High Wycombe.

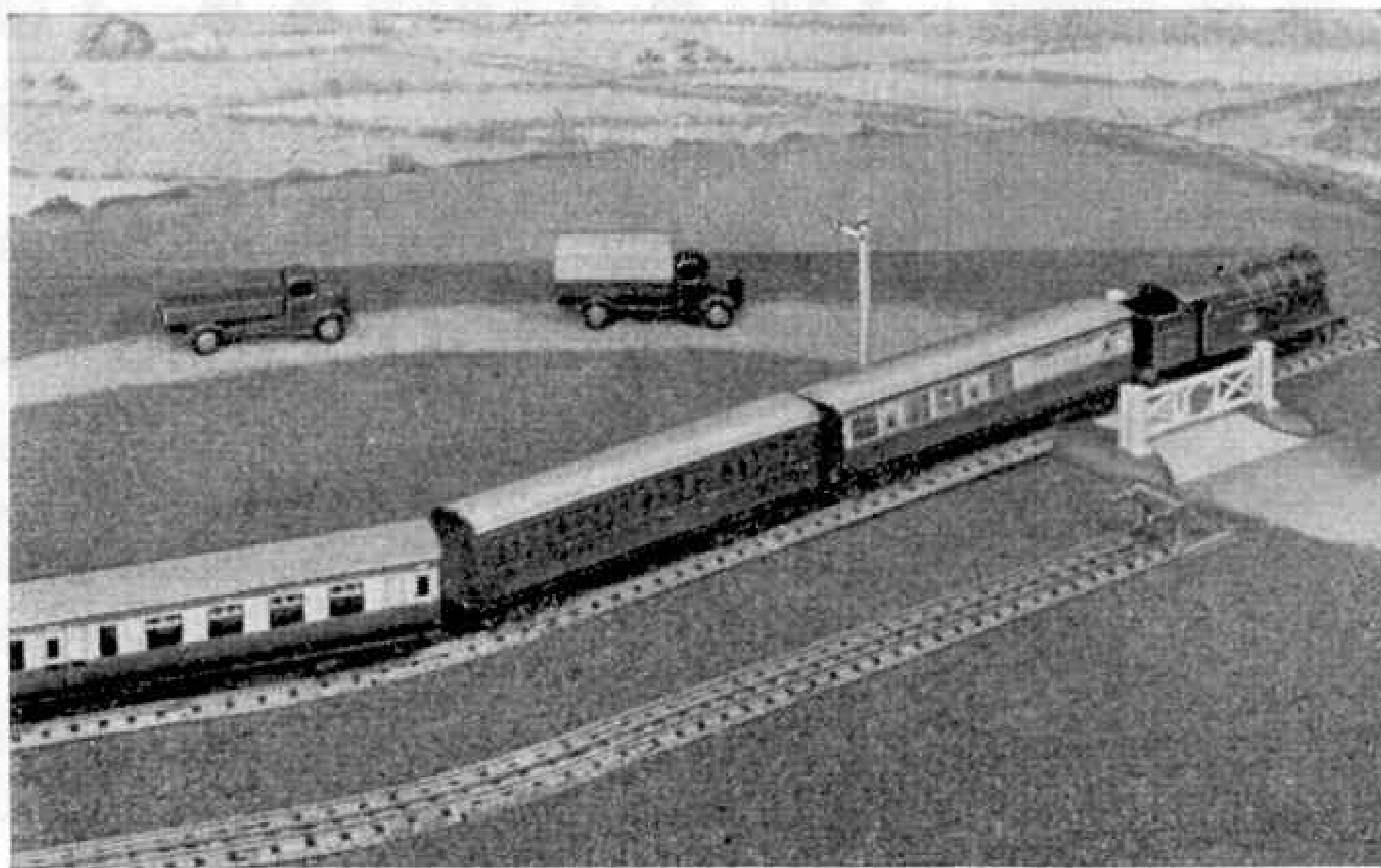
The correct marshalling of stock is a feature on this layout. Each siding is provided with a hand-operated Uncoupling Rail strategically placed, and one of these is also provided in the main line track serving the principal station, named *Lichfield*. We mention this specially because there seems to be a curious reluctance on the part of some Hornby-Dublo owners to place an Uncoupling

Rail in a main line track. There is no reason at all why this should not be done, as the trains can pass over without difficulty when the ramp is "down," which is its normal position.

But don't forget, where the hand-operated Uncoupling Rail is employed, turn the little tumbler-type lever to lower the ramp after uncoupling operations have been completed! Otherwise it may be a case of "Train divided" the next time a train comes along—a real catastrophe if it happens to be a passenger express.

The owner of a layout where Electrically Operated Uncoupling Rails only are used does not have to worry about this, for the ramp of this type of Uncoupling Rail drops out of action as soon as the operator lifts his finger from the button Switch controlling it. This electrically-operated

accessory is therefore of special value on a layout where there is much shunting and marshalling to be done. The operator can carry out the movements quickly and with certainty. This is an aid to the smart working of stations and yards, which in turn helps to keep the trains closely to schedule.



An empty stock train of varied vehicles has the right of way over the Hornby-Dublo Level Crossing.

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Stamp Collectors' Corner

By F. E. Metcalfe

ADEN AND THE HADHRAMAUT

UNTIL recently few except stamp collectors could have said what and where is the Hadhramaut. For most people in Britain their first introduction to the name came when the newspapers mentioned that R.A.F. planes were being sent to Aden with troops, whose job it would be to keep a sharp eye on certain troublesome tribes in the neighbouring States in the Hadhramaut, which is in the Aden protectorate.

Aden itself issued its first set of stamps in 1937, but it was not until 1942 that the States followed suit. Aden's set used only one design, depicting a dhow. It costs above £10, so most of us will have to be content with

a very short set. The next issue, of 1939-45, is more in our line, for though obsolete, used copies are still fairly plentiful, and apart from the normal stamps, there are one or two very good shades. These have been listed in the Commonwealth Catalogue, and are worth looking for.

The real fun began in 1951, when Aden overprinted her stamps in line with the new currency, the change meaning that instead of annas and rupees, we got cents and shillings. I said the fun began, because Aden uses quite a lot of stamps, and there had been previously a number of printings producing the shades to which I have already referred. Some of the post offices do not sell out of one printing before starting on another, and small quantities of various

releases were available for overprinting. Besides these oddments, a new printing of all values was made, and a real mixture was sent out by the Crown Agents when the overprints were released.

I had the pleasant task of looking over a



large supply that had been received by a wholesaler, and didn't I enjoy going through them! One sheet of the new printing of the 2r., made specially, had missed the overprint altogether. In another case there was a clear double surcharge on the 2½a. Altogether the supply was a philatelist's dream.

As a matter of fact, these Aden and States stamps are almost my favourites, for such good shades exist, with and without overprints.

The provisionals were replaced in 1953 with the first Queen Elizabeth set. The designs are not quite as attractive as those they replaced, and apparently the authorities did not like them either, for ever

since they have been changing the colours, and when the last four values, which have been announced as being altered, are issued, only a couple of values will remain as they appeared in 1953.

Aden has had the usual commemoratives—Silver Wedding, U.P.U. and the Coronation stamps for K.G. VI and Q.E. II, the "Peace" pair in 1946, and the special Royal Visit stamp, issued when the Queen visited the port in 1954.

The two States, Kathiri State of Seiyun and Qu'aiti State in Hadhramaut, as the latter is now called, have had philatelic histories very similar to Aden itself. Both had their first sets as recently as 1942. They were very similar in concept and

as in the case of Aden, we got the good shades, to cause more excitement when they were overprinted in 1951. An examination of the Commonwealth Catalogue will show what a fine lot of shades there are, and to see a complete collection of these States is a joy.

Unlike Aden itself, stamps used in the States are much scarcer used than mint, so I am afraid the average collector will have to be content with the latter. Of course, if you are satisfied with Aden postmarks and stamps cancelled to order, then these used are as easily come by as mint. But of the two I much prefer mint.

One point—study your catalogue carefully, so that you will know what shades there are, as some are quite scarce. For instance, there was a printing released in December 1946 of the 2a. for Qu'aiti State, and this

was of a yellowish-brown. I think the catalogue description identifies the stamp well enough for a copy to be recognised, if compared with the other two listed stamps, which are both deeper brown, lacking the yellowish tinge.

This 2a yellowish-brown was also overprinted, and if you can pick up a copy with or without the overprint at anything under 10/- you have got quite a bargain; yet stamps of the other printings are not worth as many pence. There are also very good shades of the 2r. for both Kathiri and Qu'aiti.

And now the interesting overprints are obsolete. Qu'aiti State of Shihr and Mukalla, in its changed title as already given, and Kathiri State of Seiyun have new sets. That for the former State appeared as recently as September of last year, and the designs are well worth careful study. They show what an interesting country we are dealing with, but don't be taken in too much by those imposing buildings. They look well enough on a stamp, or in a photograph, but it would seem that a plumb line is unknown in either Qu'aiti or Kathiri.

A really experienced philatelist might go in for a collection of these Aden and States stamps, used, with postmarks of the respective territories. The not so advanced might take up mint, including shade varieties as well as ordinary stamps.



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HILLIER — 35A NORTHDOWN AVENUE — MARGATE

For other Stamp Advertisements see also pages 52 and xviii.

Q.E. II SINGAPORE

Two of the **NEW PICTORIALS** from **SINGAPORE**, depicting **STRANGE SHIPS** of the **FAR EAST**, are included in this month's packet of **10 Q.E. STAMPS** given **ABSOLUTELY FREE** to all applicants for my 6d. in **1/- DISCOUNT APPROVALS**. Postage paid one way.

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THIS MONTH ALL GENUINE APPROVAL APPLICANTS WILL RECEIVE FREE SEVEN STAMPS ISSUED BY CANADA IN 1955. NAMELY: PRIME MINISTERS (2), 4c. OX, 5c. CRANE, AVIATION, ALBERTA & JAMBOREE
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PHILIP J. DYKE, 35 BUCKLEIGH AVE., LONDON S.W.20

Stamp Gossip

INDEPENDENCE ISSUES

A KIND friend in India has sent copies of the commemorative set issued by Pakistan, on 14th August, to commemorate the eighth anniversary of independence. A set to mark the seventh anniversary was issued last year, so it would seem that Pakistan has the intention of making this an annual event. If future sets are as attractive as the two already referred to, collectors will be delighted.



These stamps are being printed at the Security Press in Karachi, but the British firm Messrs. De La Rue is behind their production. Yet the designs, which are so delightful, seem to have an Eastern touch about them, so perhaps a

Pakistani artist is responsible. Whoever produced the stamps, they are attractive, and I am asking the Editor to illustrate one of them. Incidentally, they came out in time to be included in the new edition of the Commonwealth Catalogue.

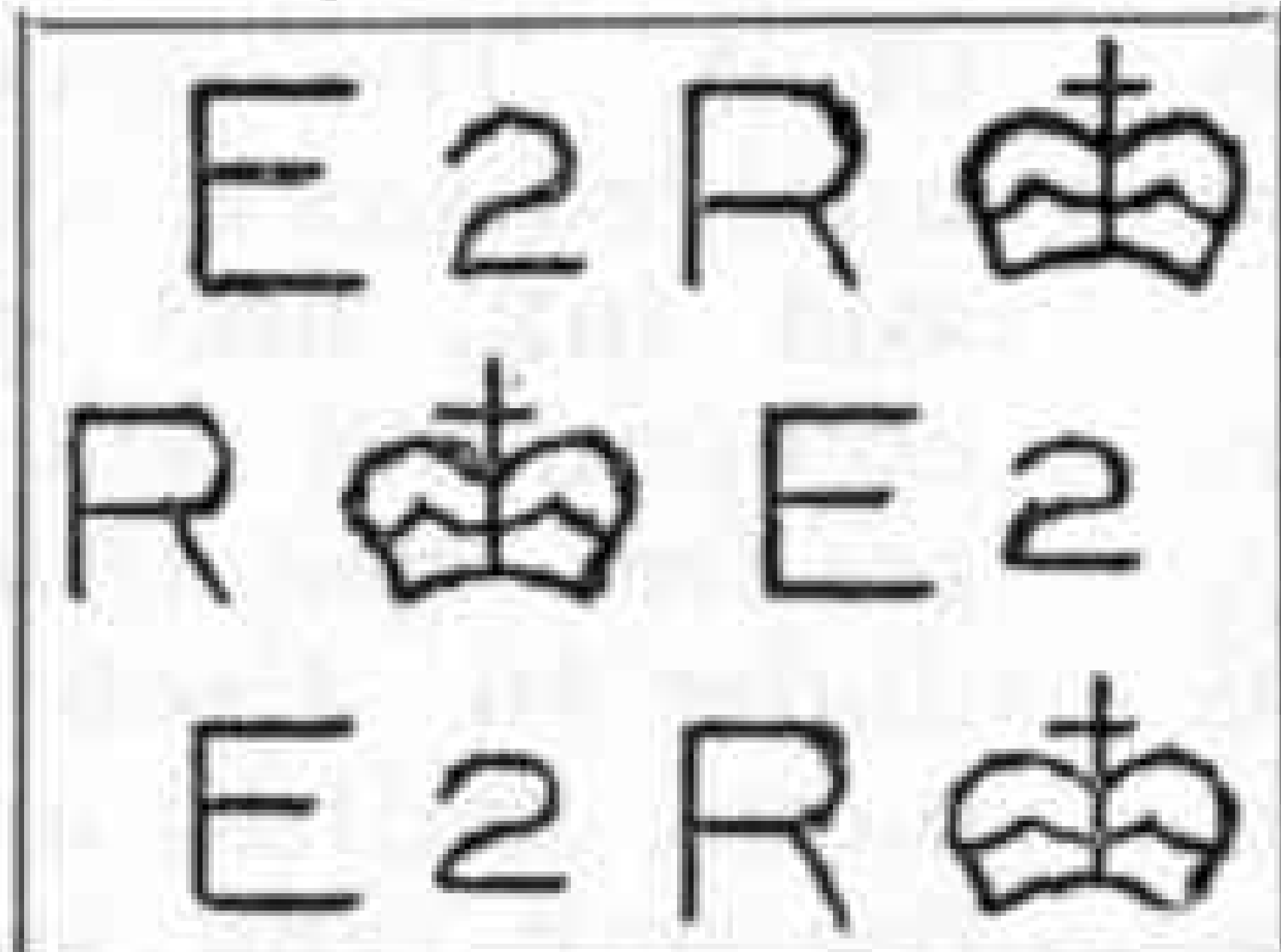
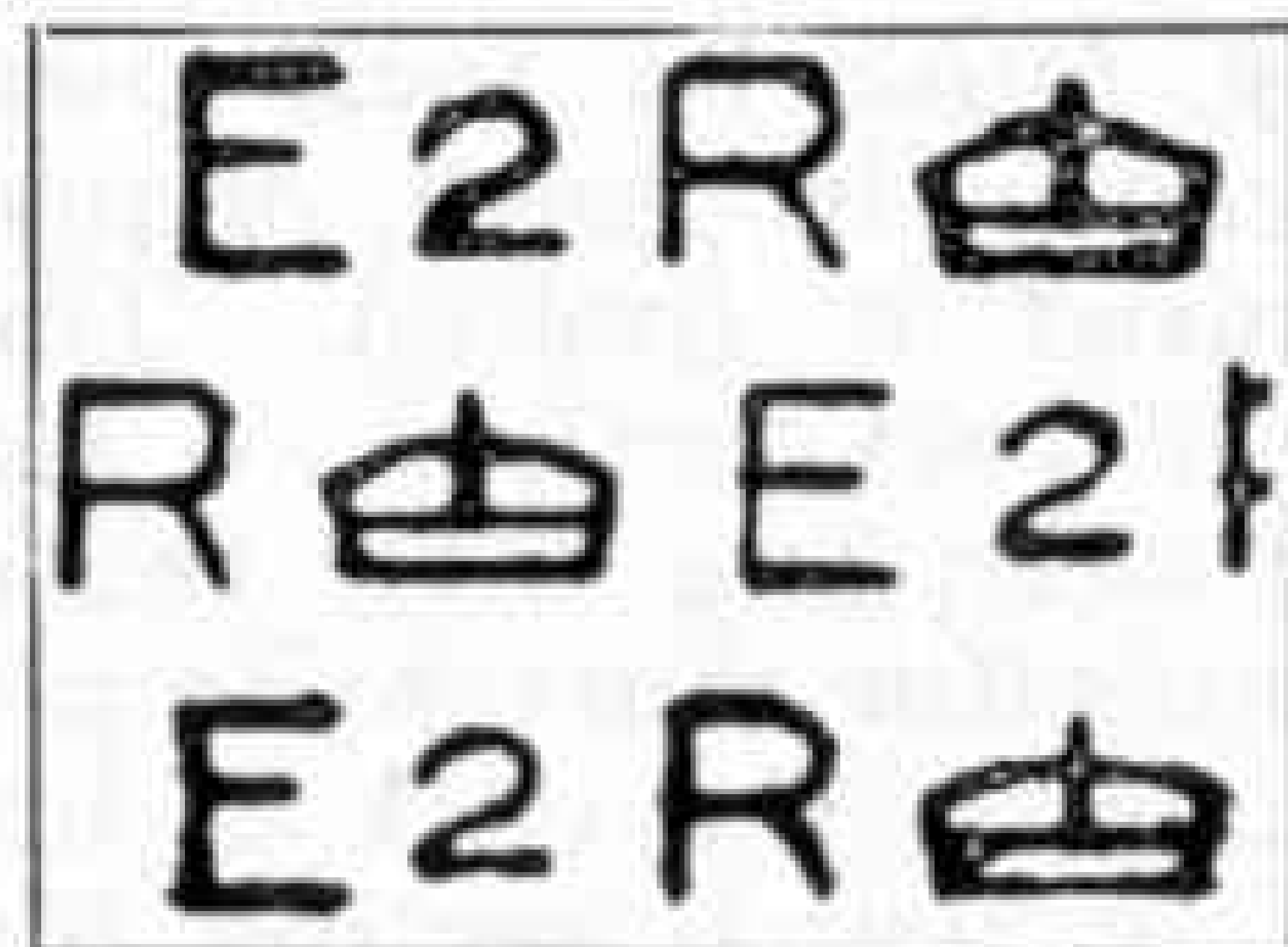
PENNY BLACKS

Recently a reader asked me if I knew how many "Penny Blacks" there are, for although thousands of copies are said to exist, nice copies now cost as much as though the stamps were really scarce.

Well, I am afraid that that is a question that I cannot answer. But while there are thousands of copies, those with four full margins and nicely cancelled—including those with fancy coloured cancellations—cost quite a lot. This is merely an example of the law of supply and demand in operation. Perhaps because it is the first postage stamp, there is no other which is in such universal demand.

Actually "Penny Blacks" are as common as flies, yet the demand is well up to supply. A year or two back, a big collection was put up for auction. Thousands of stamps were involved, quite enough to bring prices down of any other stamps, yet at the end of the auction, values seemed to be higher than ever.

I am sorry I cannot say how many there are exactly, but there may be anything up to a million or so. Yet if you want a nice copy, a pound note will



barely buy one. What a hold some stamps have!

QUEEN ELIZABETH ISSUES

My last remark applies also to the issues of the British Empire belonging to the K.G. VI period and that of Q.E. II. I frequently get letters from readers, asking which stamps they should go in for. While I prefer would-be collectors to make their own choice, and always give advice to that effect, at the same



time I know that from many points of view the stamps of our Empire issued since 1937 take a lot of beating.

As for the stamps of the present reign, now is the time to take these up, if it is desired to collect them. By beginning now, one not far from being complete can be bought at current rates, and in this respect alone such an opportunity will never occur again. It is known that the crown in the watermark of our own British stamps is being changed from one designated Tudor to one

described as St. Edward's. Both are illustrated here. The one with the wavy lines and the cross at the top is St. Edward's.

It is probable that a similar change will take place on Colonial stamps, so it will be seen that all the stamps appearing now may have a very short life.

EXAMINE YOUR STAMPS

I am afraid that all too many collectors, once they have obtained the stamps they want, at most merely glance at them casually and then into the album they go, and that's that. What a pity, for the world's finest artists and craftsmen are employed on their production, and the designs often tell a story, in a most graphic and interesting manner, to those who will take the trouble to examine them.

As a case in point just look at the Panama stamp illustrated. Under the word "Panama" you will read DUELO NACIONAL, which translated means "National Mourning." But it is the laurel wreaths at each side that explain the reason for the issue of the stamp—the death of the man whose portrait is seen is the object. The frame of the stamp is in purple, and there again we get an indication.



CHRISTMAS SEALS

About this time of the year colourful labels appear on our letters, particularly if they come from say Denmark or South Africa. These are known as Christmas seals. While they have no postal validity, they have generally cost those who have used them small sums, which are devoted for charity.

The idea is growing, and in our own country several different kinds are to be seen nearer Christmas. Some stamp collectors go in for them, and it was they who got the surprise when last year letters arrived from Cuba bearing what appeared to be seals, but were actually postage stamps. One of these is being illustrated. *Navidad* is Spanish for Christmas.

A TIP

Recently a reader wrote to say that he had received a packet of used stamps from Singapore, and had noticed pieces of envelope bearing more than one stamp, in some cases stamps of more than one of the territories. He wondered at this. The reason is that while eleven of the various States issue their own stamps, they are interchangeable.

The same writer also mentioned that there were one or two outstanding shades of the same stamp.

Competitions! Open To All Readers

Prize-winning entries in M.M. competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

Which is Your Favourite 1955 Cover?



For many years it has been customary in the January issue of the *M.M.* to give readers the opportunity of telling us which of the previous year's *M.M.* covers they like best. Above are shown in miniature the twelve 1955 *M.M.* covers. These reproductions in black and white cannot give any idea of the brilliant colours of the originals, and are intended only to serve as a reminder of what the subjects were.

We invite each entrant to state on a post card: A, which of the 1955 covers he likes best; and B, in what order he thinks the covers will be placed by the combined vote of the competitors. The covers must be referred to by the names of the month in which they appeared, and it is not necessary for a competitor to place his own choice at the top of his list under the second heading.

As usual, there will be two sections, for Home and Overseas readers respectively, and in each prizes of 21/-, 15/- and 10/6 will be awarded for the best entries in order of merit, with consolation prizes for those who just fail to gain one of the principal awards.

Entries must be addressed *1955 Cover Voting Competition, Meccano Magazine, Binns Road, Liverpool 13*. The closing dates for this contest are 29th February in the Home Section, and 31st May in the Overseas section.

Draw Your Space Ship

The prospect that the time is coming when it may become possible for Man to travel from the Earth to the Moon and the other planets is a fascinating one. An immense amount of research in the development of high altitude rocket planes will have to be done before that prospect becomes reality, but already many novel ideas as to the most suitable form of space ship for interplanetary travel have been put forward.

No doubt our inventive readers have their own ideas about the kind of space ship that they would build, and in this contest we invite them to send us a drawing of it. The drawing must be their own unaided work, and can be in pencil, or pen and ink, and coloured if desired. The competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must write his name, address and age on the back of his drawing, and state in which section his drawing is entered. There will be separate Overseas sections, and in each section prizes of 21/-, 15/- and 10/6 will be awarded.

Entries should be addressed: *Space Ship Contest, Meccano Magazine, Binns Road, Liverpool 13*. Closing dates: Home Section, 29th February; Overseas Section, 31st May.

Competition Results and Solutions

HOME

AUGUST 1955 CROSSWORD CONTEST

1st Prize: C. J. Dodson, Bramhall. 2nd Prize: R. Boyes, North Wylam. 3rd Prize: B. J. Osborne, Potters Bar. Consolation Prizes: R. Bruce, Ashted; D. Wyeth, Banbury; M. T. Callaghan, Wellington.

AUGUST/SEPTEMBER 1955 SUMMER HOLIDAY PHOTO CONTEST

1st Prize, Section A: S. S. Pethybridge, Newton Abbot; Section B: T. L. Southworth, Darwen. 2nd Prize, Section A: D. W. Allan, Birkenhead; Section B: M. Wilson, Oldham. 3rd Prize, Section A: R. M. Minshull, Macclesfield; Section B: R. E. W. Jackson, Stourbridge. Consolation Prizes: Flt.Lt. L. Hunt, Leigh-on-Sea; P. Bee, Dudley; E. M. Ross, Welwyn Garden City; R. K. Evans, Hesse; D. M. Callow, Wallasey; J. Fogg, Sunderland; J. H. Brock, London N.16; I. Whiteman, Newport; P. Chandler, Tilehurst; J. V. Steele, Newbury.

SEPTEMBER 1955 LOCOMOTIVE FIGUREWORD CONTEST

1st Prize: I. Roxburgh, Davyhulme. 2nd Prize: T. Donald, Manchester. 3rd Prize: J. C. Witt, London N.14. Consolation Prizes: S. Levinsohn, Enfield; D. Bailes, Sidecup; J. C. Pears, Penrith.

OVERSEAS

APRIL/MAY 1955 SPRING PHOTOGRAPHIC CONTEST

1st Prize, Section A: P. T. Wallis, Singapore; Section B: D. Kirkby, Valletta, Malta, G.C. 2nd Prize, Section A: R. Anderson, Perth, Australia; Section B: G. M. Gourley, Dublin, Eire. 3rd Prize, Section A: S. O. Falcon, New York, U.S.A.; Section B: S. Peters, Hastings, N.Z. Consolation Prizes: P. Skofteland, Buenos Aires, Argentina; H. Brown, Christchurch, N.Z.; A. W. Oulton, Winnipeg, Canada; P. Habersberger, Melbourne, Australia; I. Hindley, Toronto, Canada; F. L. Carter, Bombay, India.

APRIL 1955 FIGUREWORD CONTEST

1st Prize: D. Peacock, Papakura, N.Z. 2nd Prize: B. Kisch, Salisbury, S. Rhodesia. 3rd Prize: M. Hennell, Salisbury, S. Rhodesia. Consolation Prizes: P. A. Boland, Cork, Eire; W. A. Taylor, Bombay, India; B. Bartlett, Adelaide, Australia.

MAY 1955 GREATEST THRILL CONTEST

1st Prize: C. Liddell, Boughton, South Africa. 2nd Prize: B. Leach, Matakana, N.Z. 3rd Prize: C. Rodseth, Cape Town, South Africa. Consolation Prizes: E. Chipman, Montreal, Canada; C. S. Pollard, Cork, Eire; E. J. Moore, Sydney, Australia.

JUNE 1955 RAILWAY DRAWING CONTEST

1st Prize: W. N. Osborne, Winnipeg, Canada. 2nd Prize: P. O'Flaherty, Dublin, Eire. 3rd Prize: P. Turner, Durban, South Africa. Consolation Prizes: A. Phillips, Georgetown, British Guiana; W. Kelvin, Sydney, Australia; N. Kelvin, Sydney, Australia.

JUNE 1955 MOTOR CAR CONTEST

1st Prize: T. King, Christchurch, N.Z. 2nd Prize: D. Cooper, S. Taranaki, N.Z. 3rd Prize: P. Simmonds, Yala-Lagos, Nigeria. Consolation Prizes: A. K. Mason, Pietermaritzburg, South Africa; R. Evans, Toronto, Canada; L. Abel, Nairobi, Kenya Colony.

SOLUTIONS

APRIL 1955 FIGUREWORD CONTEST

Attacker, Pembroke, Noratlas, Argonaut, Scorpion, Beverley, Guardian, Chipmunk, Sycamore,

MAY 1955 GREAT THRILL CONTEST

1. Piloting the World's first Space Ship. 2. Making a footplate trip on *The Elizabethan*. 3. Driving a car in the Monte Carlo Rally. 4. Piloting a jet 'plane through the sound barrier. 5. Climbing Mount Everest. 6. Taking part in the Olympic Games. 7. Building a giant bridge. 8. Playing in a Test Cricket Match. 9. Visiting South Africa as a member of the British Rugby Union touring team. 10. Being Captain of the *Queen Mary*. 11. Entering the House of Commons as a Member. 12. Appearing on Television.

JUNE 1955 MOTOR CAR CONTEST

1. Hillman "Husky" 4cyl. 1265cc. 6½ gal. 5.00/15. 2. Morris "Oxford" 4cyl. 1489cc. 12 gal. 5.50/15. 3. Austin "Hereford" 4cyl. 2199cc. 12½ gal. 5.50/16. 4. Wolesley "Six-ninety" 6cyl. 2639cc. 13 gal. 6.00/15. 5. Armstrong-Siddeley "Sapphire" 6cyl. 3435cc. 16 gal. 6.70/16. 6. Bentley "Continental" 6cyl. 4875cc. 18 gal. 6.50/16. 7. Daimler "Conquest" 6cyl. 2433cc. 15gal. 6.70/15. 8. Triumph "Renown" 4cyl. 2088cc. 14 gal. 5.75/16. 9. Vauxhall "Cresta" 6cyl. 2262cc. 11 gal. 5.90/15. 10. Ford "Popular" 4cyl. 1172cc. 7 gal. 4.50/17.

JULY 1955 NAMED TRAINS CONTEST

1. The Shamrock, B.R. (L.M. Region); London (Euston) — Liverpool (Lime Street). 2. The Golden Arrow, B.R. (Southern Region) and S.N.C.F.; London (Victoria) — Paris (Gare du Nord). 3. Lone Star, St. Louis South Western Rly.; Memphis — Shreveport — Dallas, U.S.A. 4. The Night Ferry, B.R. (Southern Region) and S.N.C.F.; London (Victoria) — Paris (Gare du Nord). 5. The Black Diamond, Lehigh Valley R.R. — Philadelphia and Reading Rly.; New York — Philadelphia — Buffalo, U.S.A. 6. Empire Builder, Chicago, Burlington and Quincy R.R. — Great Northern Rly.; Chicago, Portland and Seattle, U.S.A. 7. The Comet, B.R. (L.M. Region); London (Euston) — Manchester (London Road). 8. The Cornishman, B.R. (W.R.); Penzance — Kingswear — Midlands. 9. The Devonian, B.R. (E.R., L.M.R. and W.R.); Bradford (Forster Sq.) — Kingswear. 10. The Scandinavian, B.R. (E.R.); London (Liverpool Street) — Parkeston Quay.

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August 1955 Crossword Puzzle

For Valour—(Continued from page 4)

distinction apart from being Britain's most cherished award. It has always been made from cannon captured at Sebastopol, but a few years ago supplies ran out and a substitute was found by the War Office. This was found to be unsuitable, but fortunately another gun was accidentally discovered, so that this tradition of manufacture continues.

It was Queen Victoria's most earnest wish that the Victoria Cross should not fall into disrepute, as previous honours had done; that it should be "highly prized and eagerly sought after by the officers and men of our naval and military services." It can be fairly be said that her intention has been fulfilled. After one hundred years—and two world wars—only 1,344 Victoria Crosses and three bars have been won.

Aboard H.M.S. "Ark Royal"—(Continued from page 8)

scanners mounted under their fuselages, and the ship's three helicopters—two S-55 Whirlwinds and one S-51 Dragonfly. Later, they will be joined by two squadrons of Sea Venom two-seat all-weather fighters.

H.M.S. *Ark Royal* is already a fine, proud and efficient ship, although she has had her aircraft embarked only since early October. Her crew are very conscious of the traditions they have inherited. The first *Ark Royal*, built for Sir Walter Raleigh in 1587, became the flagship of some of Britain's greatest sailors and led the chase of the beaten Armada into the North Sea in 1588. She displaced 692 tons, cost £5,000 and remained in service until 1636.

The second *Ark Royal* had a displacement ten times that of the first and was a converted merchant vessel which served the R.N.A.S. as a seaplane tender throughout the 1914-18 War. She was dragged out of reserve in World War II, and served until 1946, although her name was changed to *Pegasus*, because the third *Ark Royal* had, meanwhile, been commissioned.

No. 3 was, of course, the great wartime carrier of 22,000 tons. Now we have the new *Ark Royal*, an even greater, mightier vessel, armed with sixteen 4.5 in. guns and 45 smaller guns, in addition to her aircraft, and reputed to have cost over £20 million. If with me you could have seen her speeding through the Channel at nearly 30 knots, with great mountains of water curving away from her sleek hull, you would have thought it a small price to pay for such a combination of fighting efficiency and beauty.

Road and Track—(Continued from page 13)

Since then designer Colin Chapman has driven Lotus-based cars in international sports car events all over the world, seeking always to improve their design in the light of his own experience. His forceful policy has paid handsome dividends, for in two seasons forty different drivers of Lotus based cars have won over two hundred awards in sports car races alone in Great Britain.

I personally lost count of the number of times last season that Chapman in the Mark IX Lotus was not only leading his class, but was also in front of cars with larger engine capacity, as for instance in the T.T. when, with a 1100 c.c. Coventry Climax engine, he led all the 2 litre and 1½ litre cars.

If one day you decide to build a Lotus then all you need, according to Colin Chapman, are normal hand tools and a bench. No welding or machining facilities are required, and axles, engine and gearbox are easily obtained.

Power from Lightning—(Continued from page 23)

We do know a lot today about lightning conductors and similar ways of minimising thunderstorm damage. It has been discovered that, to be fully effective, a conductor must have its lower end buried deep in damp earth, dry soil or sand being poor conductors of electricity.

Lightning flashes have been measured for length as well as for duration. They may flash through

twenty miles of air, but there are sometimes short ones only about a mile long. Most flashes last only about one-hundredth of a second; they seem much longer because the retina of the human eye retains the image.

The longest flash ever recorded lasted nearly one second, but such a flash is a great rarity. Even the smallest flash discharges enough electrical energy to keep an ordinary electric fire alight for ten years, and a flash lasting a whole second would have as much electrical energy as the combined output of all the electrical power stations in Great Britain.

One of the newest branches of thunderstorm science is the detection of such storms as they are born, 1,000 miles or more from the United Kingdom. Radar detector equipment records lightning flashes as far away as the Bay of Biscay, where freak weather destined for Britain is often bred.

New Meccano Model—(Continued from page 43)

pedal 17 is depressed the Screwed Rod is rotated slightly and the Strips 20 press the two 3" Pulleys and the Motor Tyre into frictional contact to engage the drive. As soon as the pedal is released the drive is disconnected.

A cover over the lower part of the Cord drive is provided by a Flanged Sector Plate. This is attached to the Motor by a ½" Reversed Angle Bracket, and to one side of the column by a 2½" Strip and an Angle Bracket.

Parts required to build the Power Press: 6 of No. 1; 14 of No. 2; 1 of No. 3; 11 of No. 5; 2 of No. 6a; 4 of No. 8; 2 of No. 11; 12 of No. 12; 2 of No. 12a; 2 of No. 15; 4 of No. 16; 2 of No. 17; 2 of No. 19b; 2 of No. 22; 1 of No. 22a; 1 of No. 24; 1 of No. 24a; 1 of No. 26; 1 of No. 27a; 10 of No. 35; 118 of No. 37a; 96 of No. 37b; 16 of No. 38; 1 of No. 40; 1 of No. 45; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 1 of No. 54; 2 of No. 80c; 1 of No. 111a; 6 of No. 111c; 3 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 142c; 1 of No. 147b; 1 of No. 187; 3 of No. 188; 3 of No. 189; 2 of No. 191; 4 of No. 192; 1 of No. 198; 2 of No. 212; 1 of No. 213; 2 of No. 214; 1 No. 1 Clockwork Motor.

BASSETT-LOWKE MODEL RAILWAYS

The new Bassett-Lowke Catalogue is a well-produced, good-quality handbook presenting a wide range of miniature railway equipment in Gauges 0 and 00. For the most part it deals with Bassett-Lowke productions in Gauge 0, including steam railways in that gauge. In addition to finished models and accessories, from signals to scenery, there are plenty of parts, fittings and mechanisms for those who like to construct their own models, as well as the drawings, diagrams and so on necessary for successful modelling.

In the 00 Gauge section ready-made equipment of various makes, including Hornby-Dublo, is shown, with plenty of illustrations and information for the miniature railway owner. Copies can be obtained from Dept. M.R./17, Bassett-Lowke Ltd., Northampton, price 2/-

BOND'S MODEL AND EXPERIMENTAL ENGINEERING HANDBOOK

Bond's O'Euston Road Ltd., 357 Euston Road, London N.W.1, have now issued the 1955-56 edition of their handbook. Revision has brought 00 Gauge railway material, including Hornby-Dublo, into the first section. Then come Gauge 0 products, and after that details of locomotive parts and castings for live steam models in the larger gauges. The wide range of parts in each section will appeal specially to the home modeller.

The products dealt with also include stationary, marine and aero engines in miniature, and there are attractive pages for the ship and aircraft modeller. Drawings, blue prints, wood and a useful range of B.A. Screws and Nuts for modellers conclude this useful publication, copies of which are available from the address shown above at 2/- each.

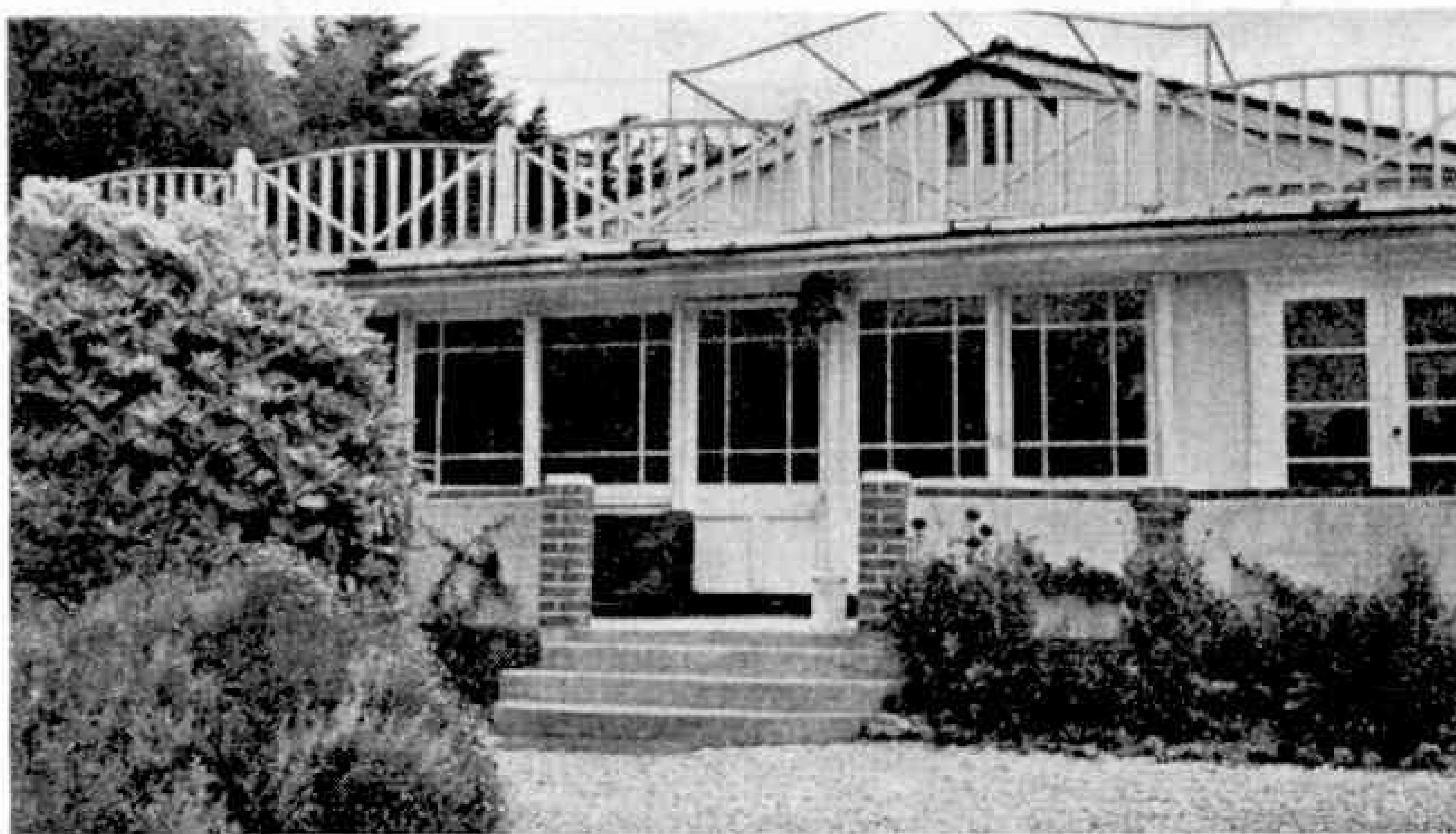
From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

A "Peaceful" Home

In many parts of England, more especially around the coasts, there are homes made from old railway rolling stock. Many of these are well worth a second glance from those of us who are railway enthusiasts, or who like to uncover a strange bit of history.

I have "discovered" a former Royal train that is now a family house, and an ex-Canadian Pacific coach from the Wembley Exhibition, now close by the sea in Sussex. But perhaps the most interesting of all I have found is a bungalow at Middleton-on-Sea, Sussex, built around some of the coaches from Marshal Foch's H.Q. train in which the first armistice agreement was signed at Compiègne in November 1918. The beautiful panelling and special fittings, such as the map cases used by the Marshal, can still be seen.



This bungalow at Middleton-on-Sea, Sussex, incorporates coaches from the train in which the 1918 armistice was signed. Photograph by N. M. Woodall.

Disused coaches can still be bought by the public and cost something like 25/- per foot. But I'm afraid that special "carriages with a story" are rare.

N. M. WOODALL (Bournemouth).

A Hindu Temple

The Indian temple illustrated on this page is on a small plateau about 600 ft. high, near the almost deserted village of Amber. Leading to this plateau is a twisting and turning path, at the top of which is an arch making an entrance in the walls, which encircle the whole plateau. Inside the walls the impression is that of being in a floating palace, with the blue cloudless sky above and mountains on every side.

The temple walls are made of granite, artistically carved. The roofs of the neighbouring chambers are held up by stone elephants. The interior walls of these chambers are studded with mirrors, reflecting your every movement a thousand times, and the windows are transparent pictures of beautiful coloured glass.

The interior walls of the temple itself are of marble and on each side of the corridor leading to the shrine are gold shields and other symbols of the god in whose honour the temple is built. At one side of the entrance to the worshipping room is a huge gong.

D. J. BREW (Belfast).



Entrance to the worshipping room of Amber Temple. Photograph by D. J. Brew, Belfast.

Fireside Fun

Jim: "Dad, what are ancestors?"

Father: "Well, my son, I'm one of your ancestors. Your grandmother is another."

Jim: "Then, why do people brag about them?"

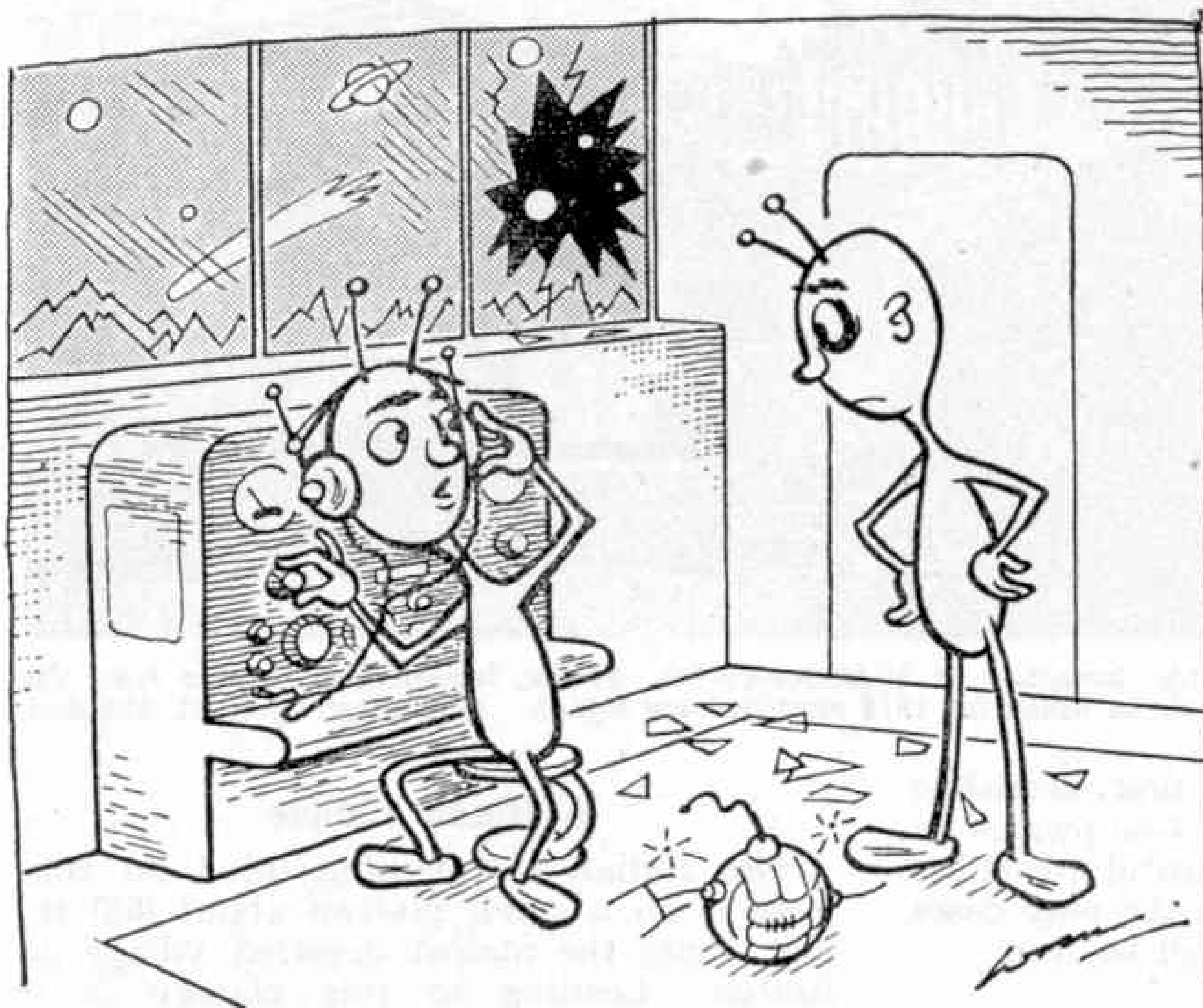
* * *

The old river boat captain was bragging full blast. "Yes," he said proudly, "I really know this river like the palm of my hand. There ain't a sand bar in it that I ain't familiar with."

Just then the boat ran aground with a sickening urch.

"See," he said calmly, "there's one of them now."

* * *



"It's Earth - they say please can they have their ball back?"

(Reproduced by courtesy of "The Aeroplane")

First Tramp: "Wotcher lookin' so miserable about?"

Second Tramp: "Why, I just found a recipe for home made cake, an I ain't got no home!"

* * *

Pat: "What does an envelope say when it's licked?"

Mike: "Nothing. It shuts up."

* * *

Lady: "Constable, can you tell me the quickest way to the hospital?"

Traffic Policeman: "Yes, just stand where you are."

* * *

Smart Alick: "I saw something last night I'll never get over."

Dim Wit: "What was it?"

Smart Alick: "The Moon."

* * *

Teacher: "This is the fifth time I've punished you this week. Now Jimmy, what have you to say?"

Jimmy: "I'm glad it's Friday."

Vicar: "Ah, good morning, Mrs. Smith. I'm glad to see you taking a tramp into the country."

Mrs. Smith: "Tramp indeed! I'll have you know this is my husband."

* * *

A certain railway company always insisted that a station-master should send in a full report at once of any accident however small. One morning the Superintendent received the following urgent message from one station-master: "Man fell from platform in front of train. Will send further details later."

Some time later the Superintendent received a second message:

"Everything O.K., man not injured. Engine was going backwards."

* * *

Father: "A retaining fee, my boy, is the fee paid to the lawyer before he will undertake to do any work for a client."

Son: "I see, dad, like putting a shilling in the meter before you get any gas."

Policeman: "Didn't you see the notice 'Fine for Parking,' Madam?"

Lady: "Yes, officer, and I thought it really was a fine place for parking."

Captain: "Have you polished the brass and cleaned the deck?"

Seaman: "Ay, ay, sir; and I've swept the horizon with a telescope."

The diner struggled manfully with his steak but could not cut it. At last he summoned the waiter.

"I'm sorry," he said, "but I can't cut this. Please take it away and bring me another."

The waiter peered intently at the steak. "I can't do that, sir," he said. "You've bent it."

"There goes a fellow who takes the worst view of everything."

"Is he a pessimist then?"

"No, he's an amateur photographer."

A baby sardine saw a submarine and swam straight home in fright to tell mother.

"Don't be silly," said the latter. "It was only a tin filled with people."

BRAIN TEASERS

WHAT IS THE WORD?

If you add the same three letters at each end of ERGRO you can make a familiar word. What is it?

HISTORICAL QUIZ

Molten lead poured from the roof of a famous London building on fire in the seventeenth century. This dramatic episode is vividly described in a book written by a famous writer of historical novels. Can you name the building and the book?

THE MISSING LETTER

By adding the same letter at the end of each of the following pairs of letters you can make eight common three-letter words. What is the letter that must be added?

LA	FI	VE	CO
TA	FO	BO	MI

MECCANO MOTORS

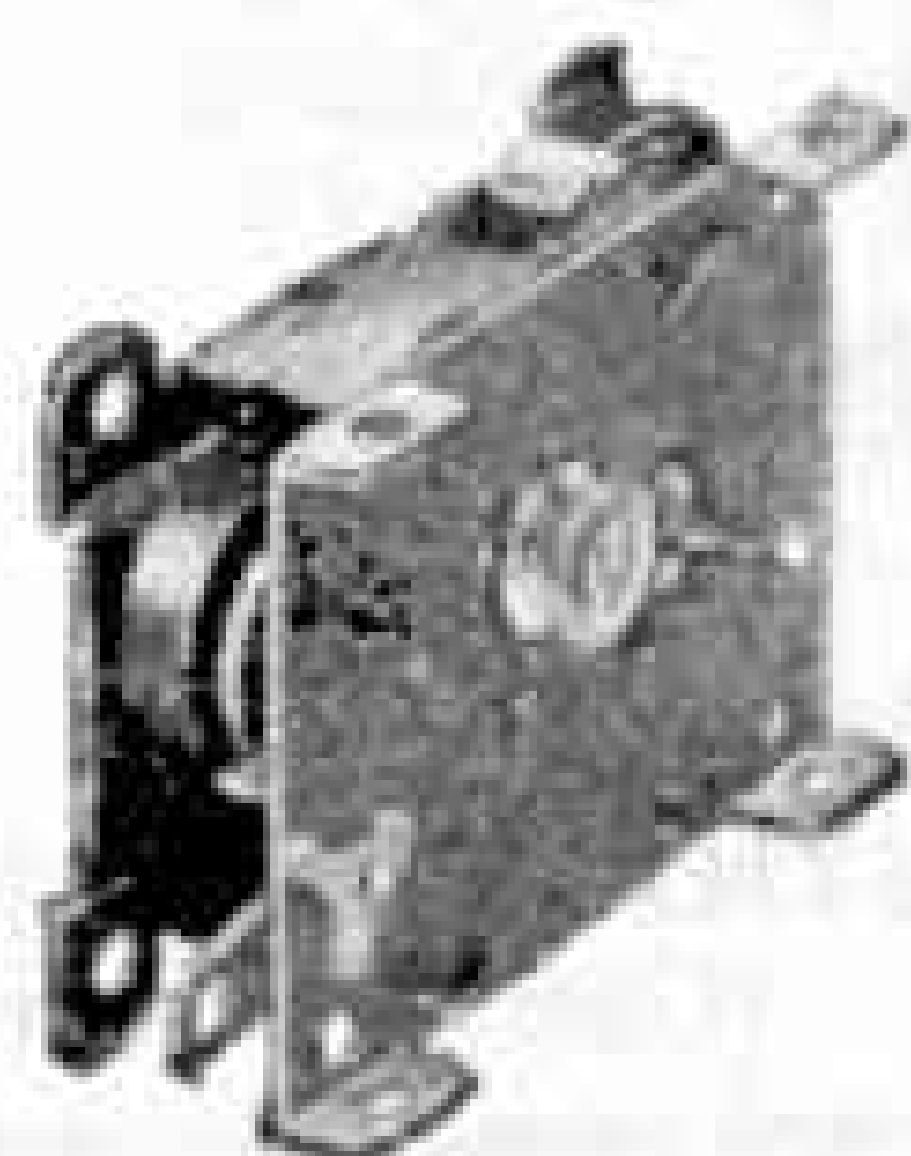
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The Meccano Clockwork Motors fit easily into Meccano models, and their precision-cut gears make them smooth and steady in operation.

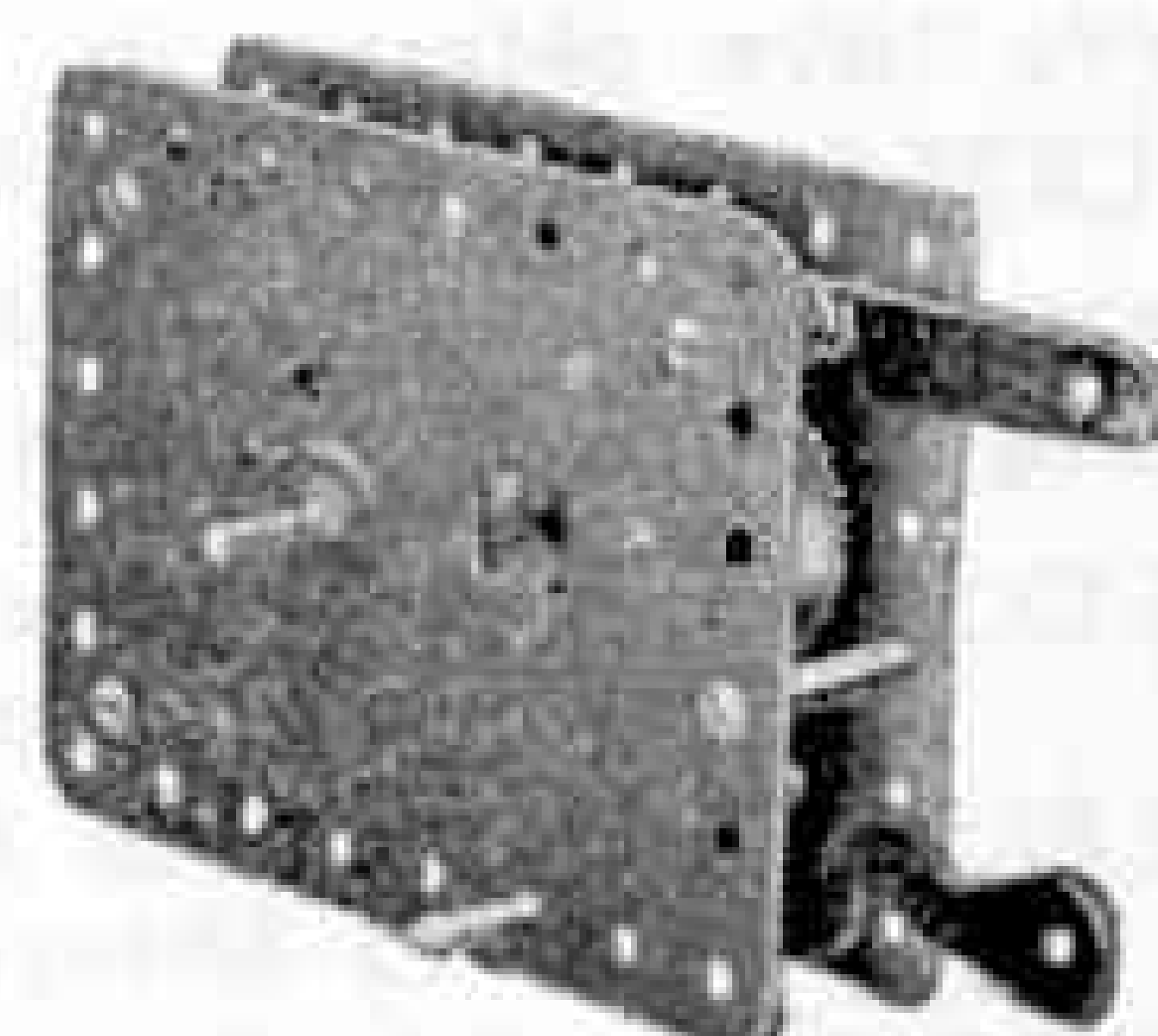
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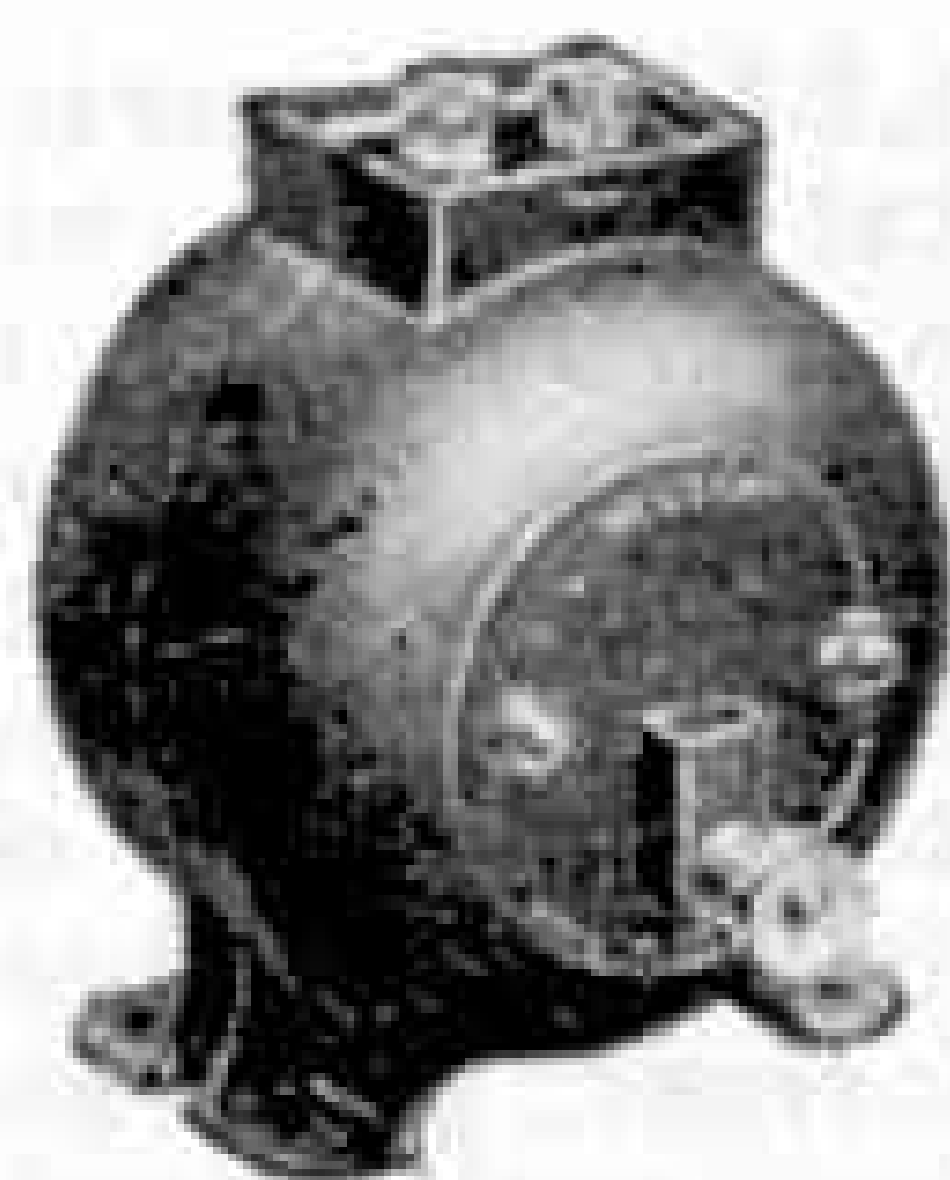
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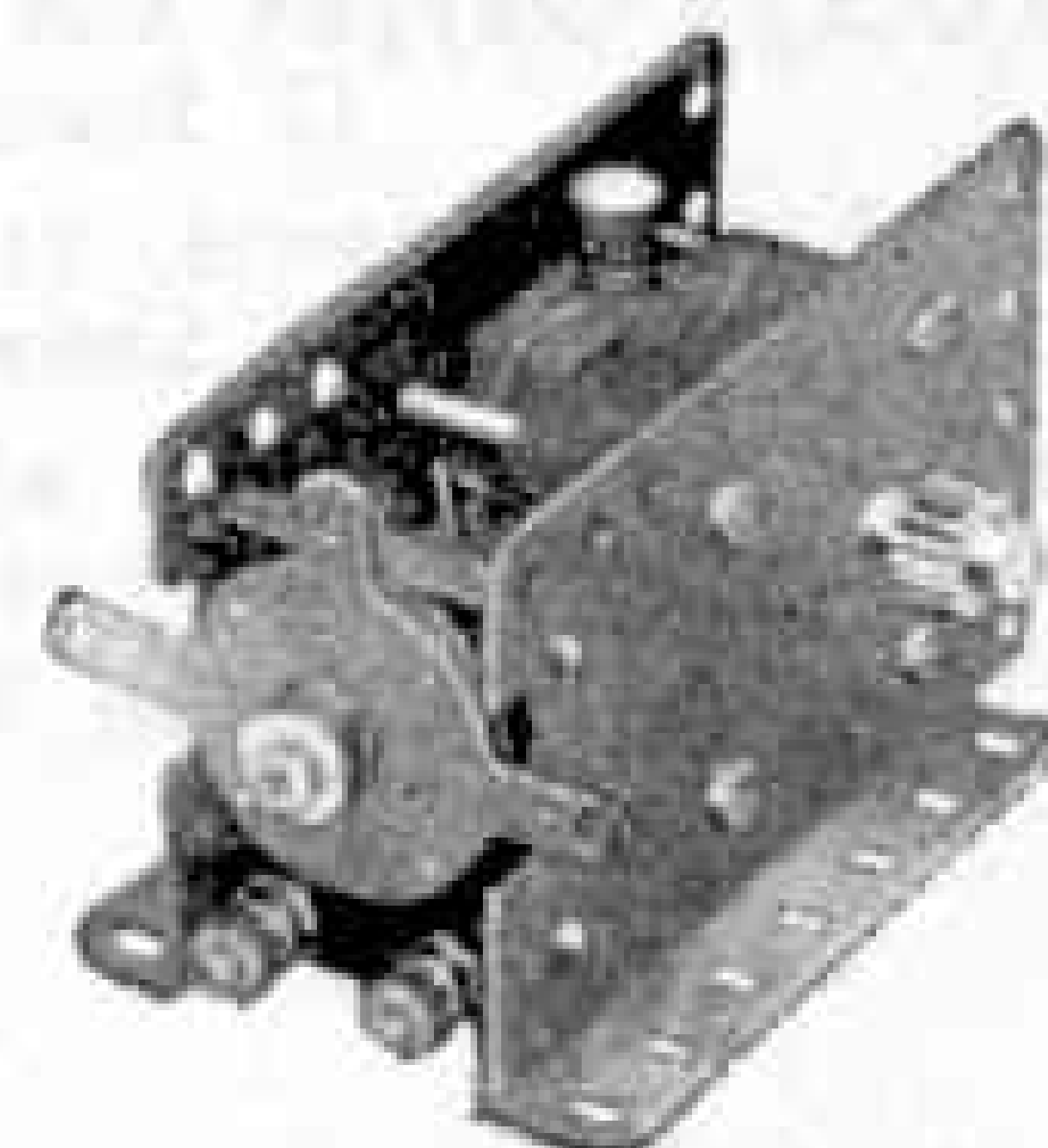
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No. E20R Electric Motor

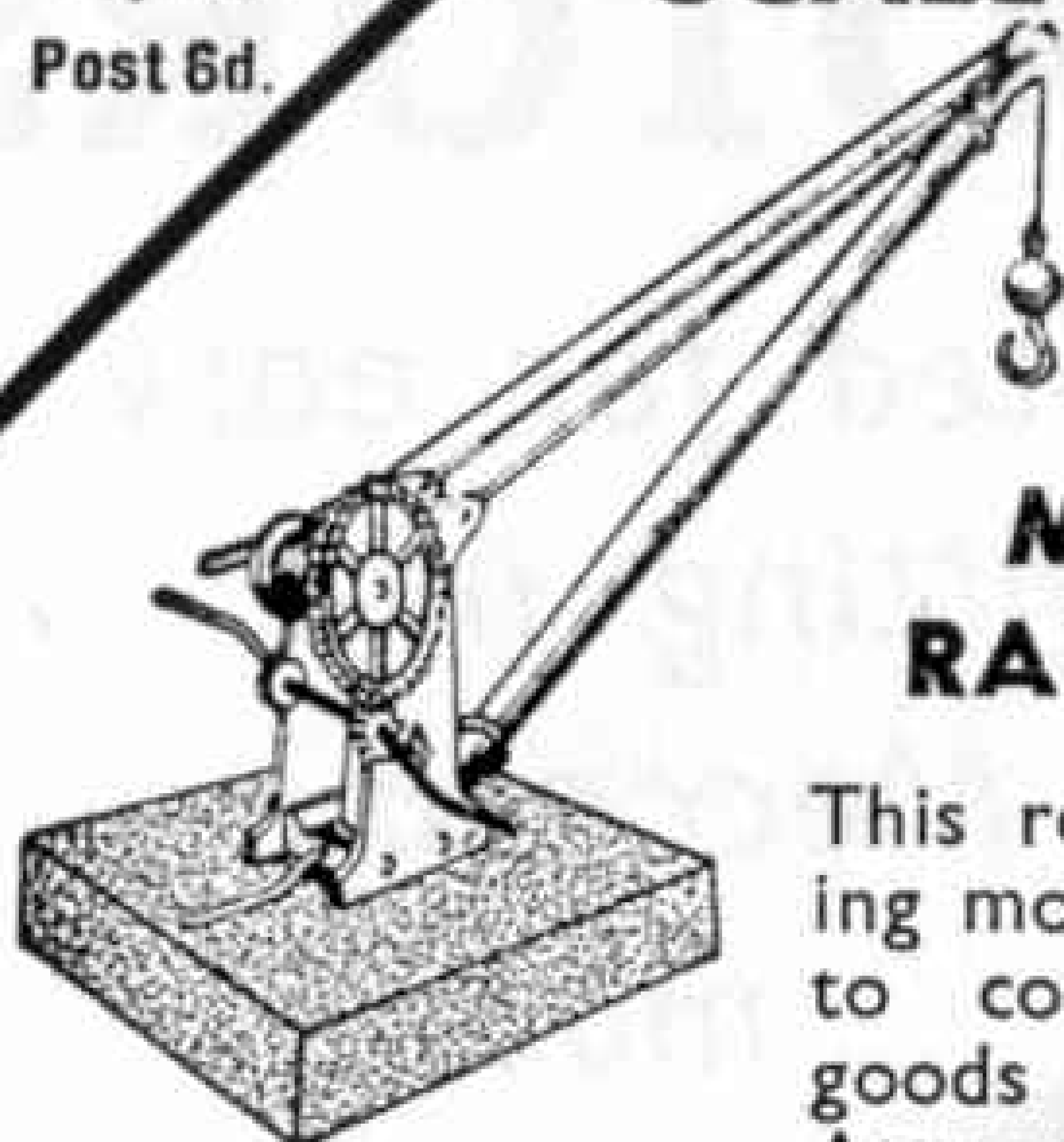
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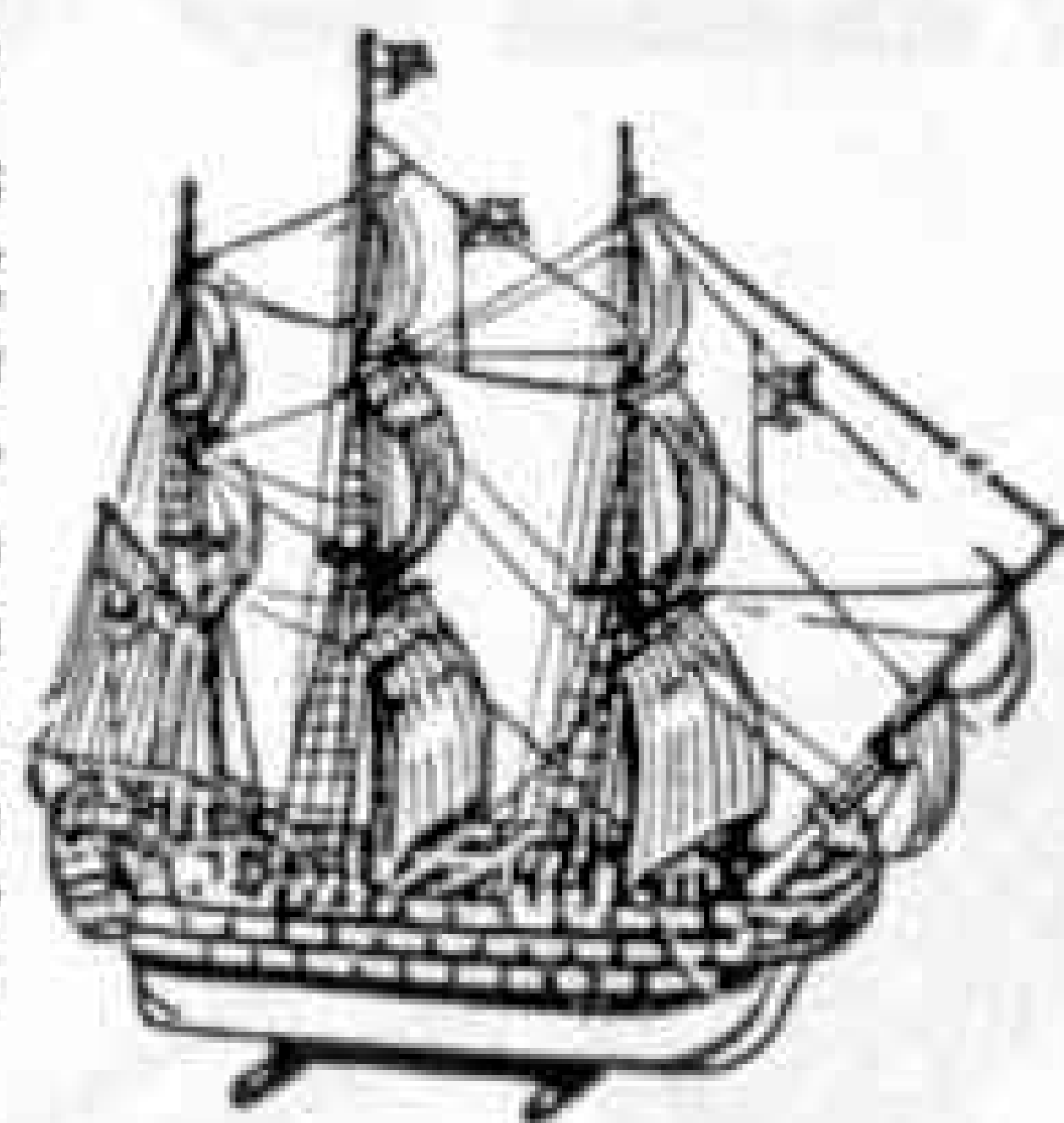
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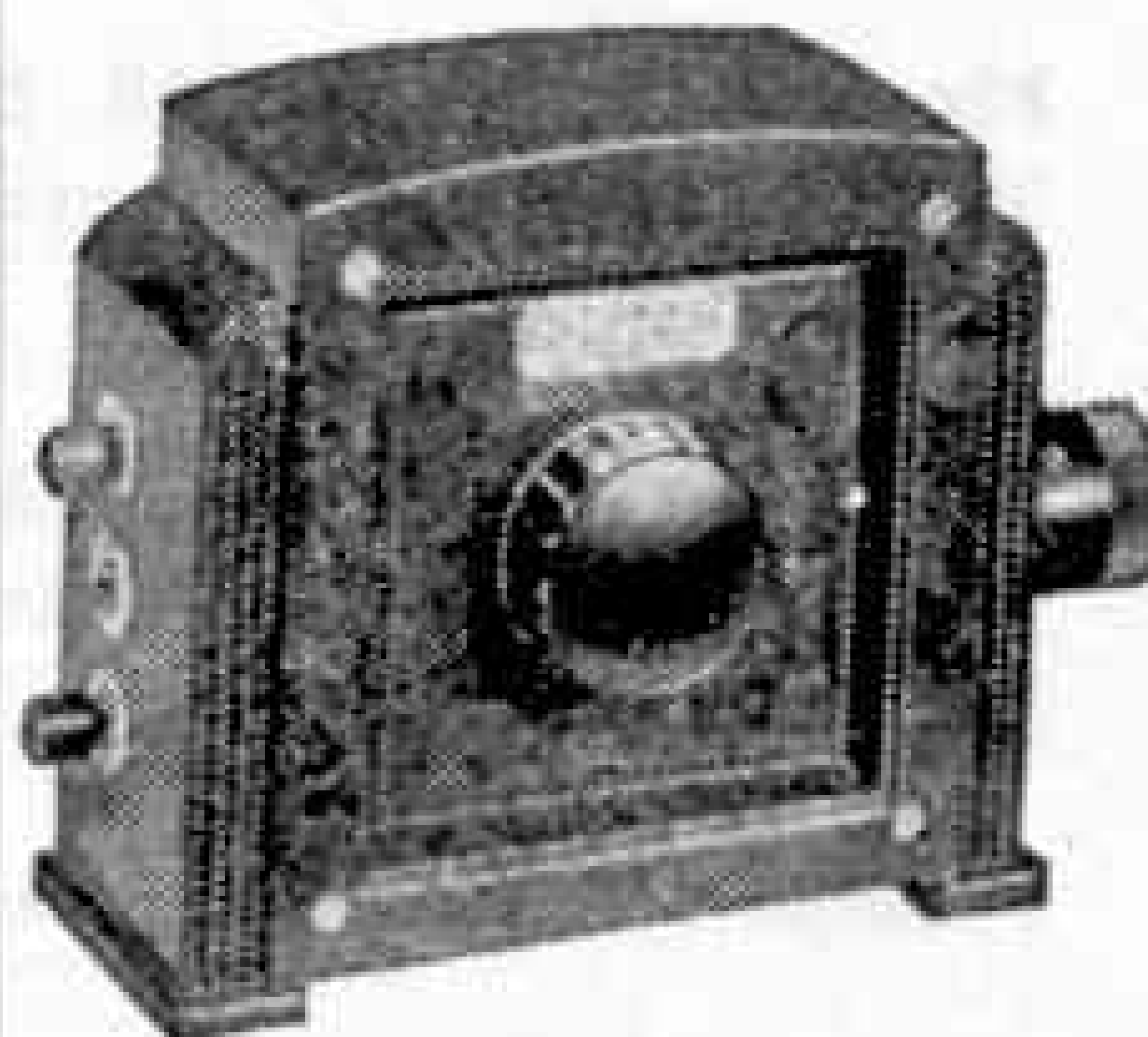
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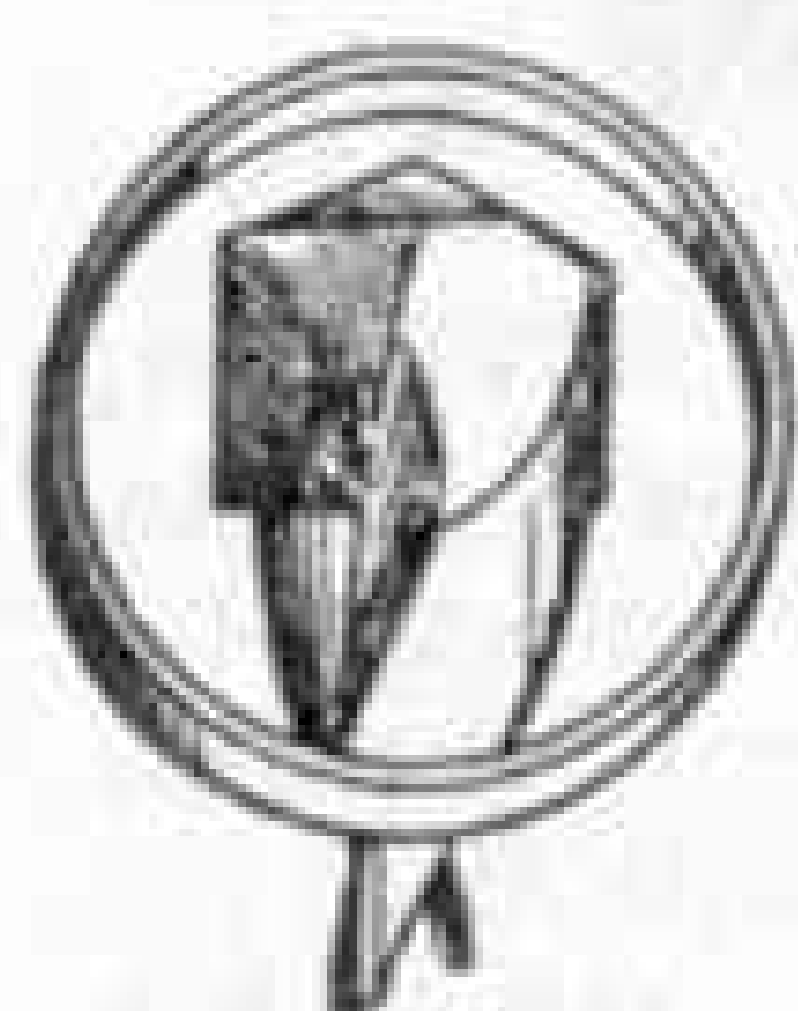
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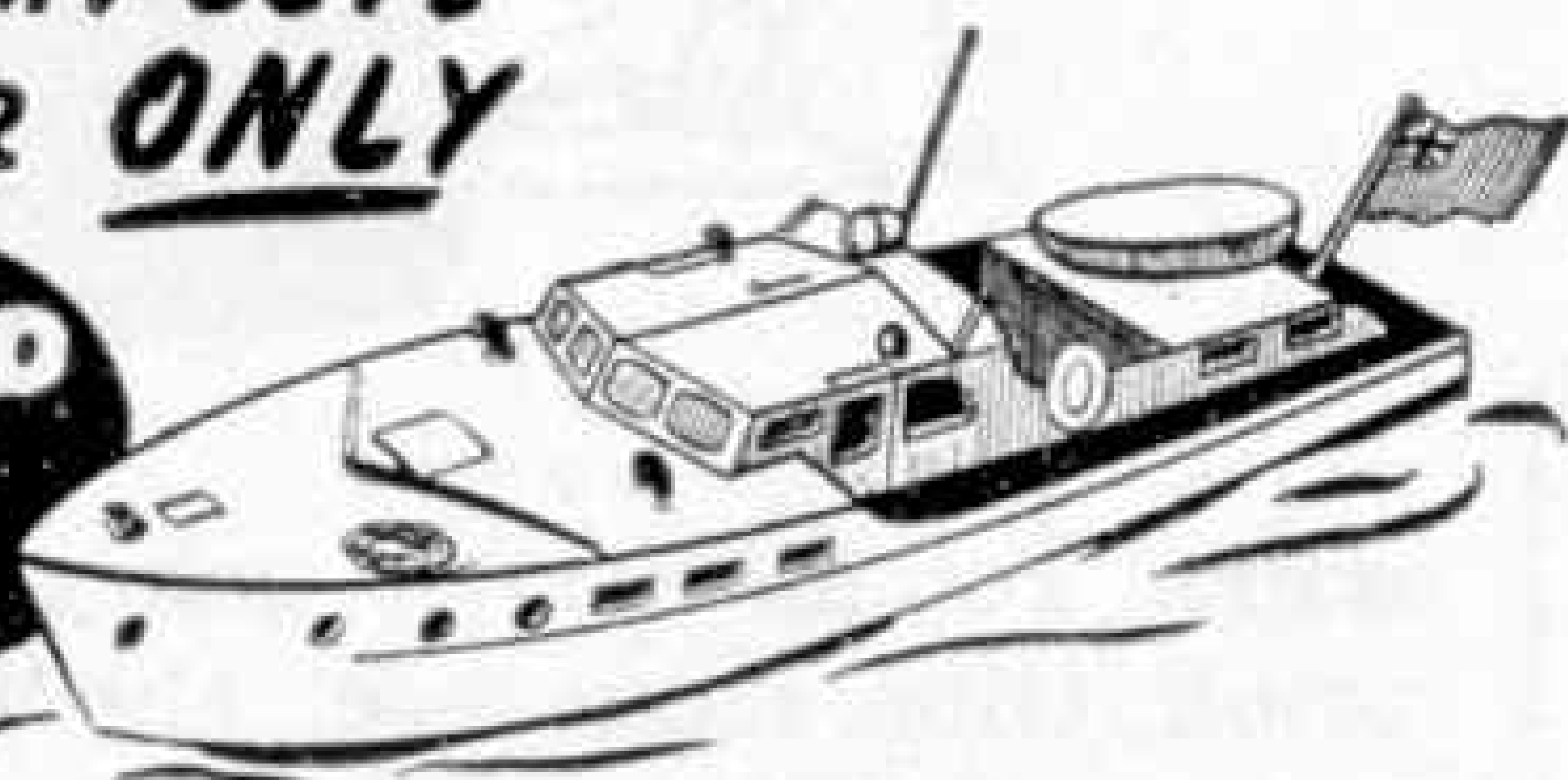
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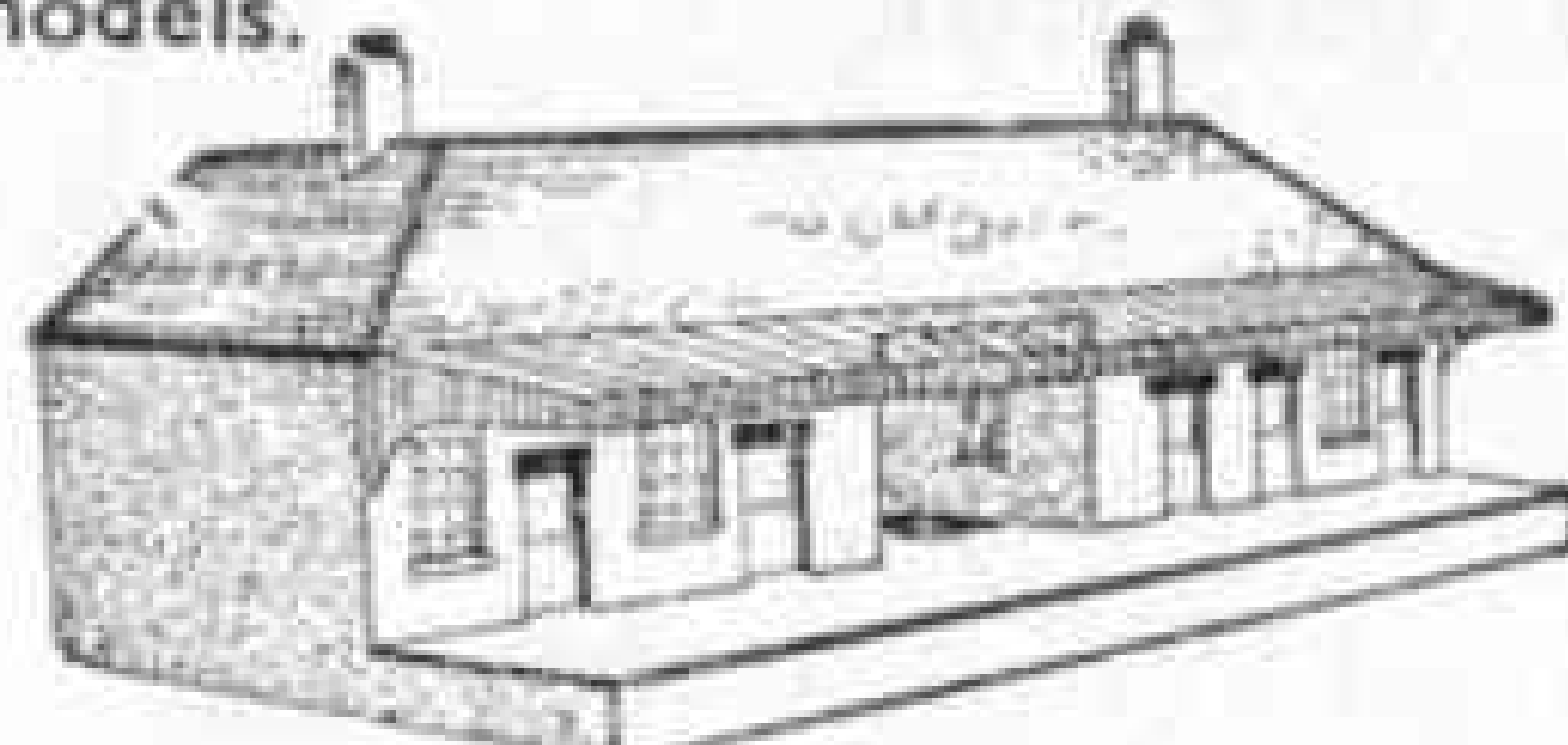
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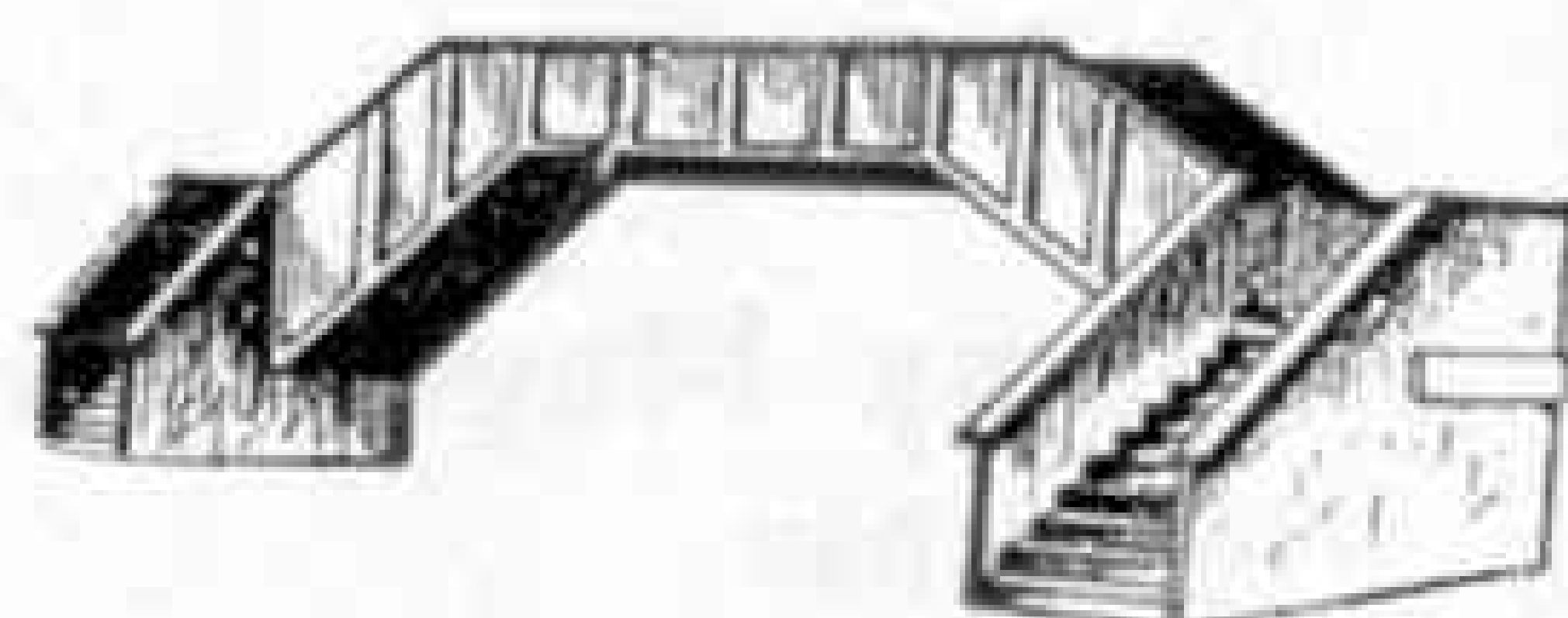
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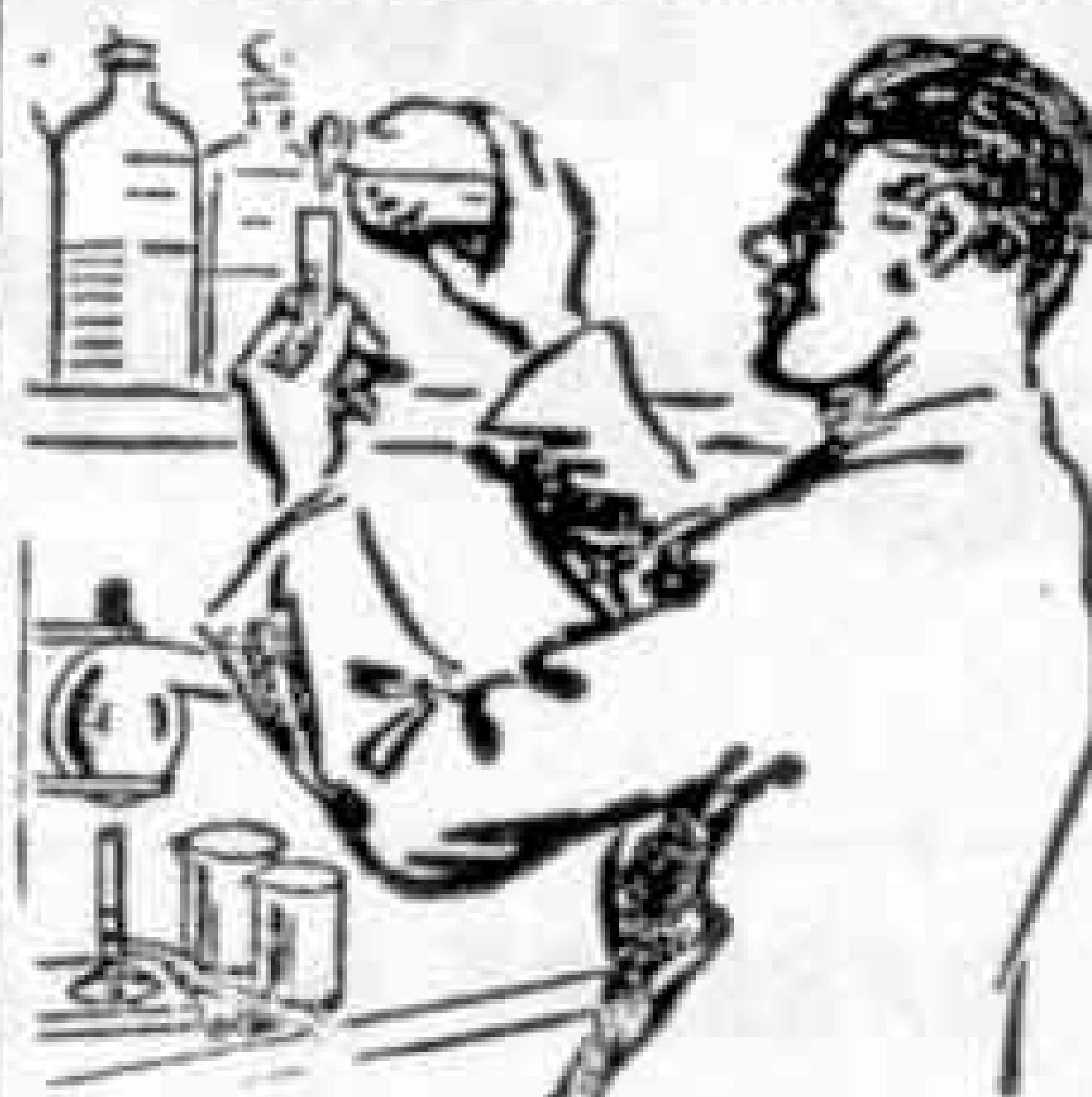


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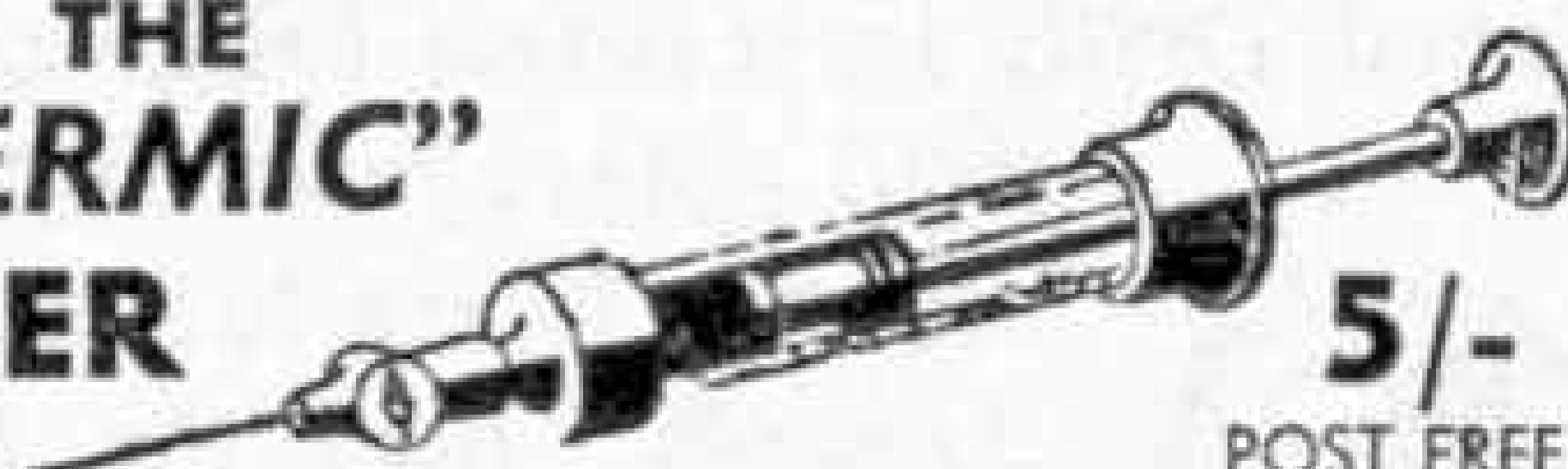
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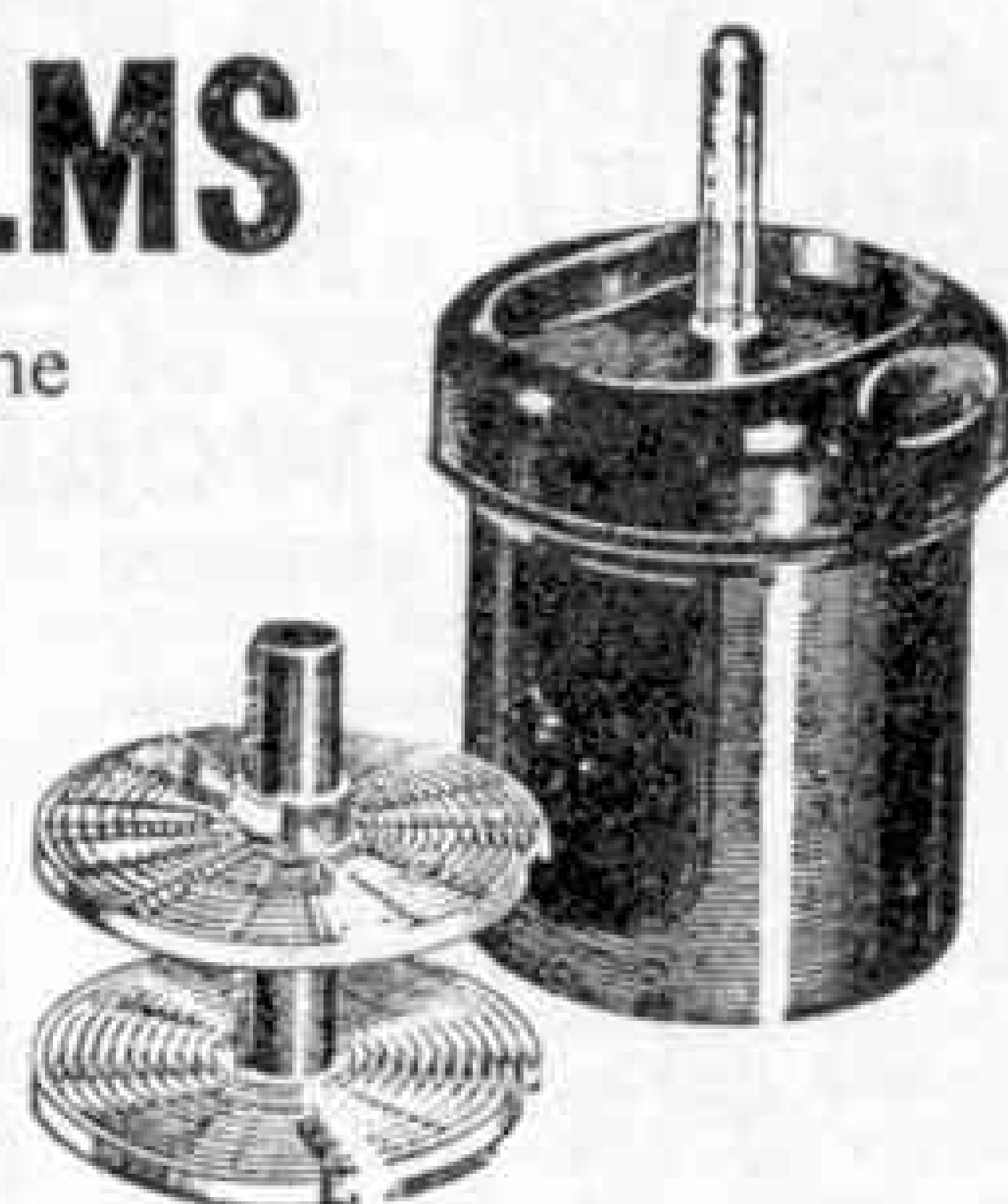
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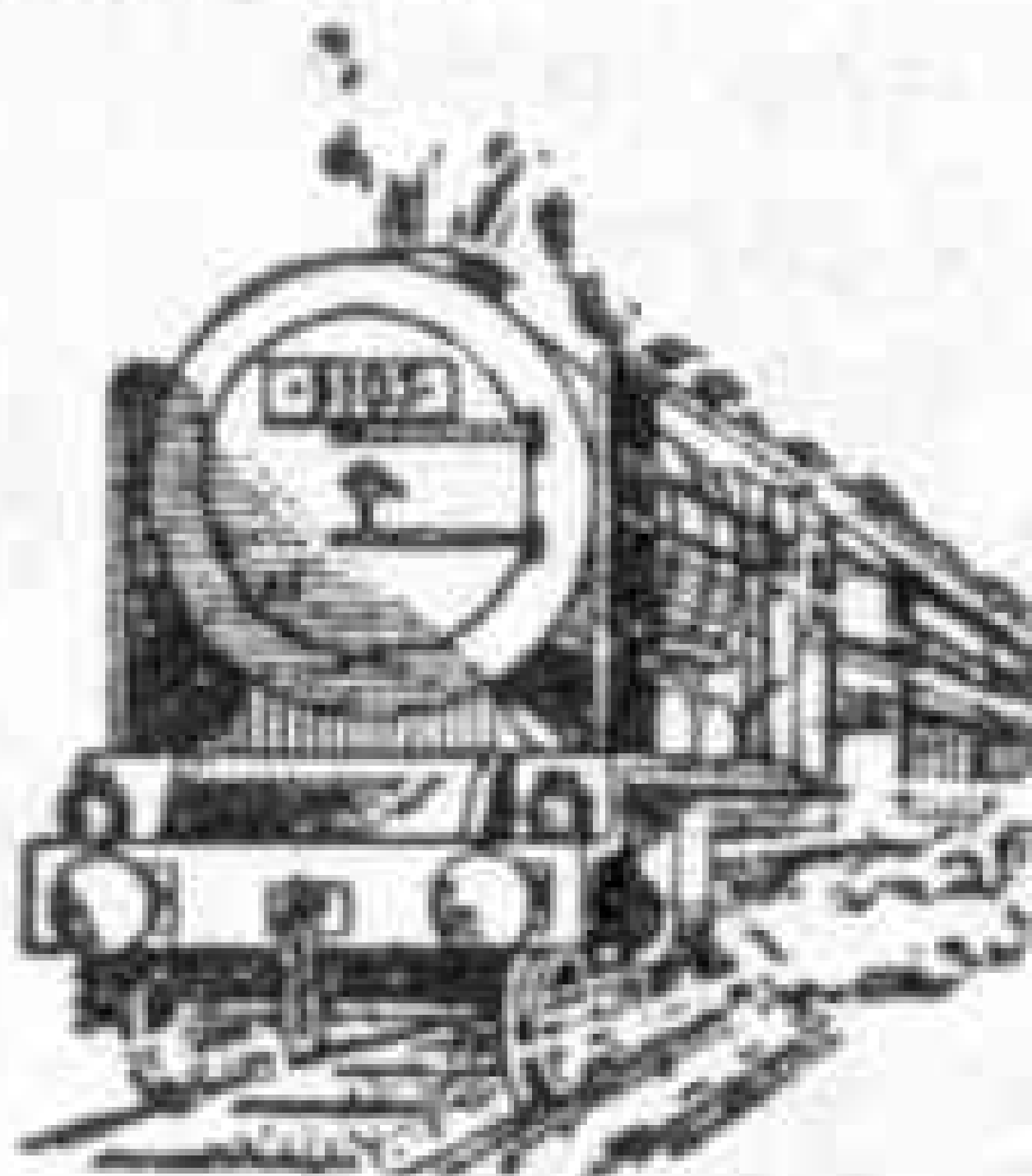
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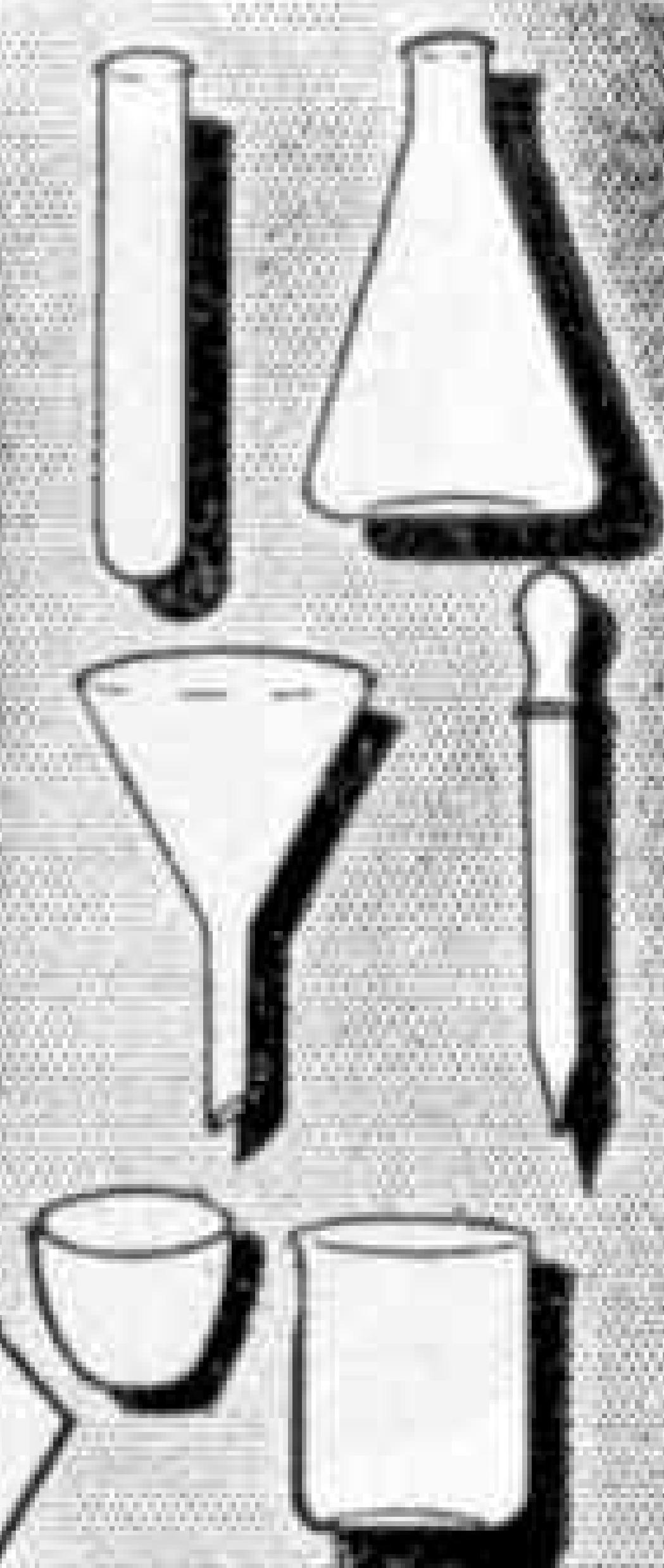
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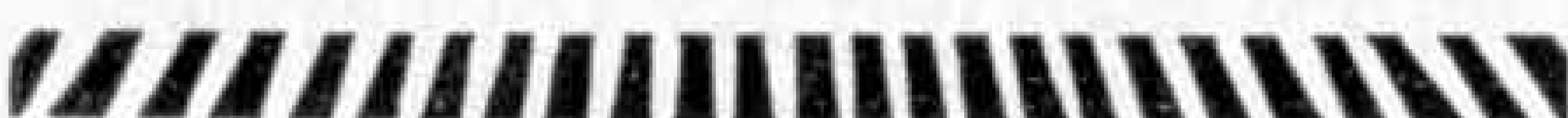
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(a) Edward VII, (b) Queen Victoria, (c) George V?

2 What is unique about the famous bridges at the Le Mans motor-racing circuit in France?

Is it (a) on wheels, (b) in the shape of a motor tyre, (c) used by cars?



3 Who has the right-of-way at a cross-roads roundabout?

4 What is, or was, the "Golden Arrow"?

(a) a specially-built car that broke the World's Land Speed Record, (b) a train that runs between London and Paris?

5 Who was the first man to fly the English Channel?

(a) Charles Kingsford-Smith, (b) Henri Farman, (c) Louis Bleriot?

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1 Edward VII. **2** (b) They are shaped like a Dunlop Fort tyre and are used by pedestrians to cross the track. **3** No-one. **4** Both answers are correct. The car was driven by the late Sir Henry Seagrave. **5** (c) Louis Bleriot.

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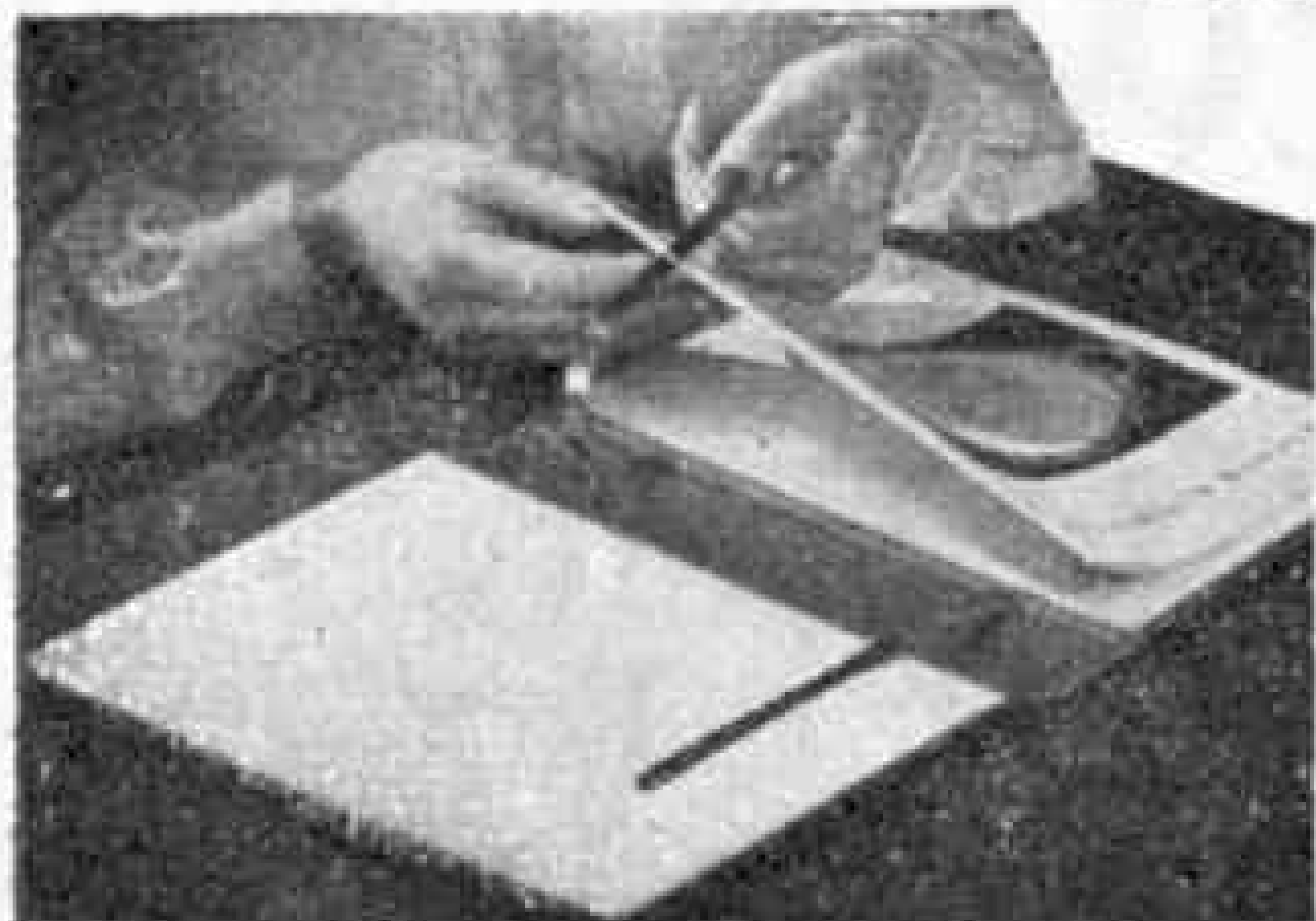
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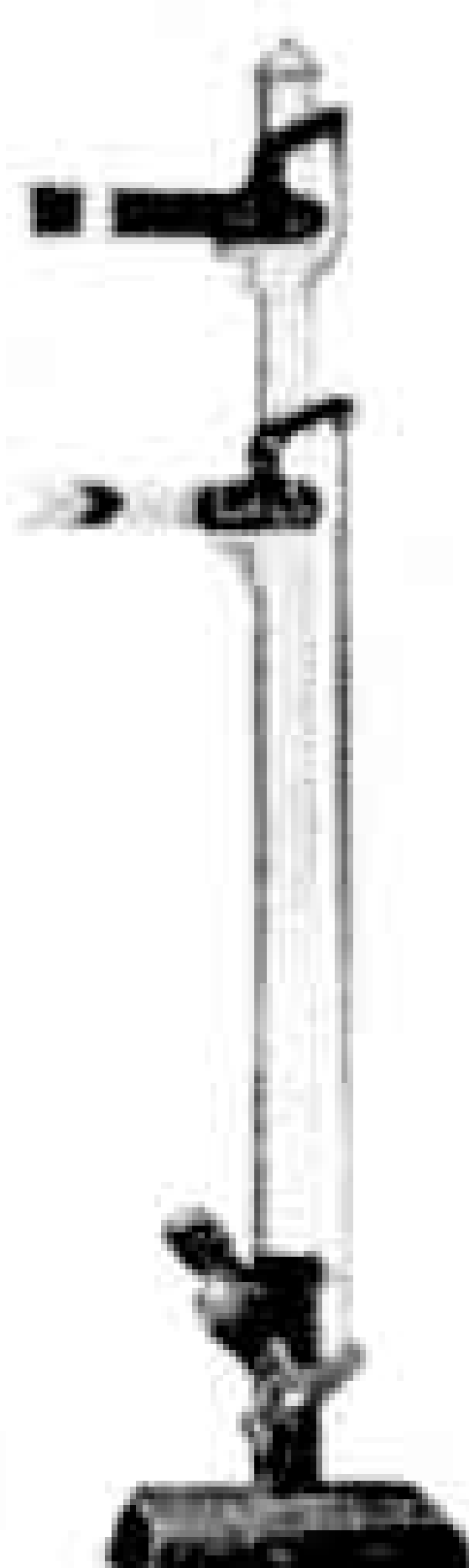
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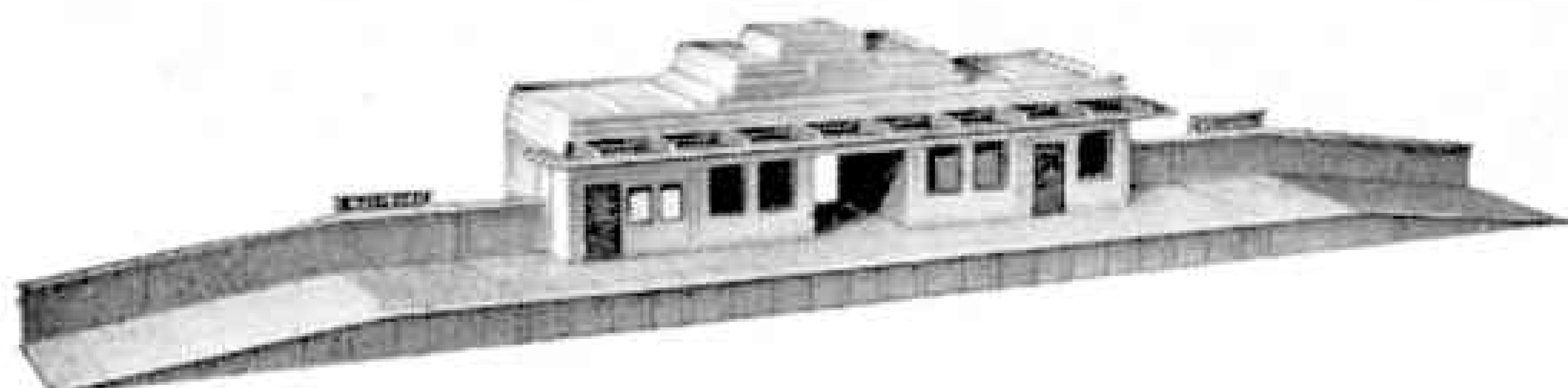
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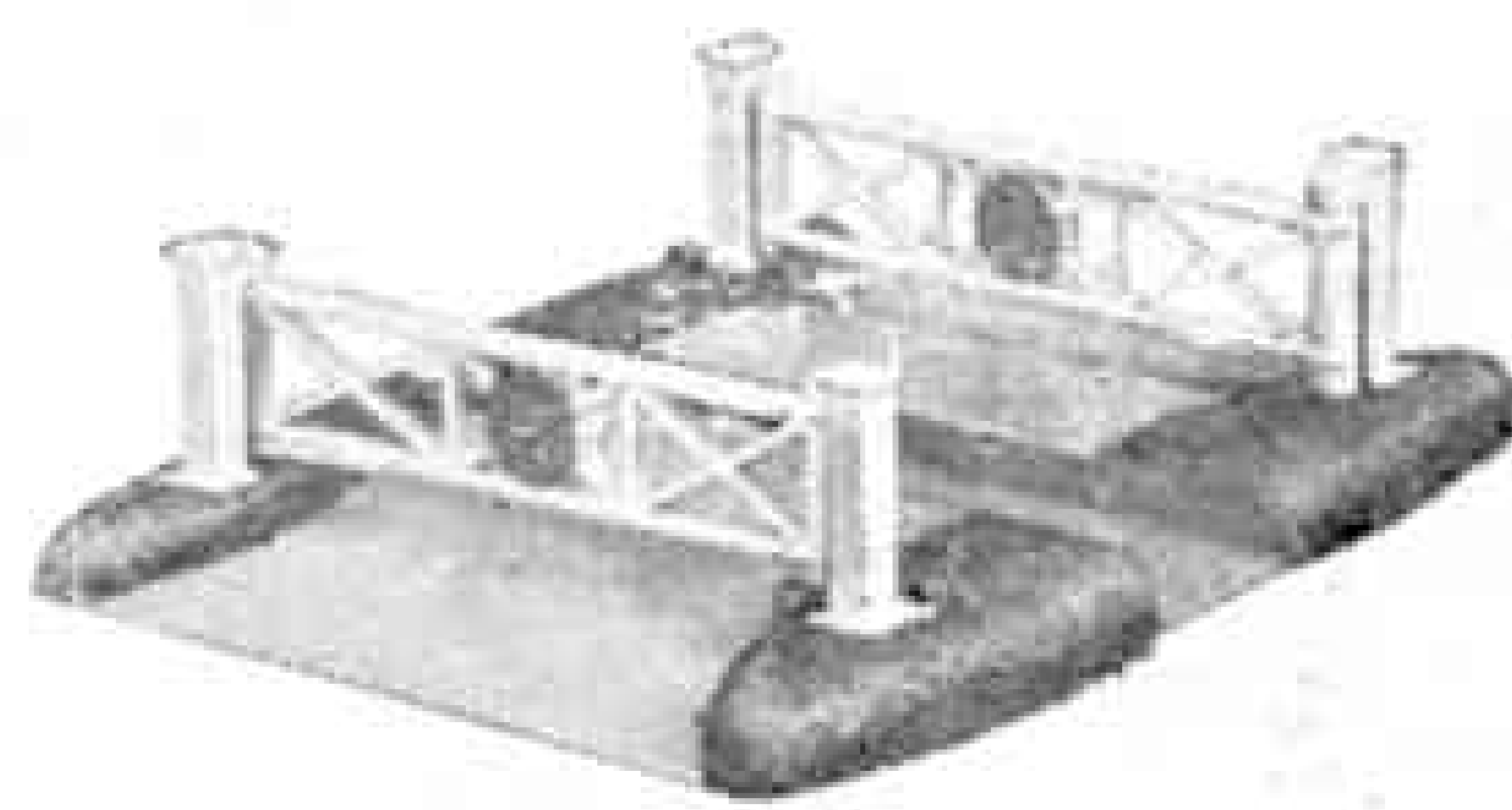
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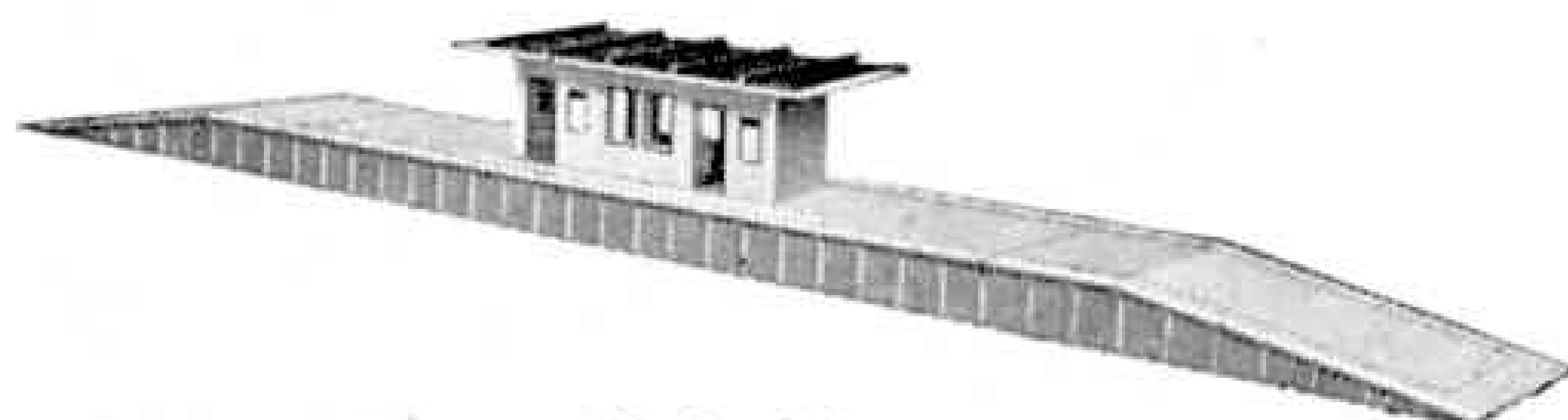
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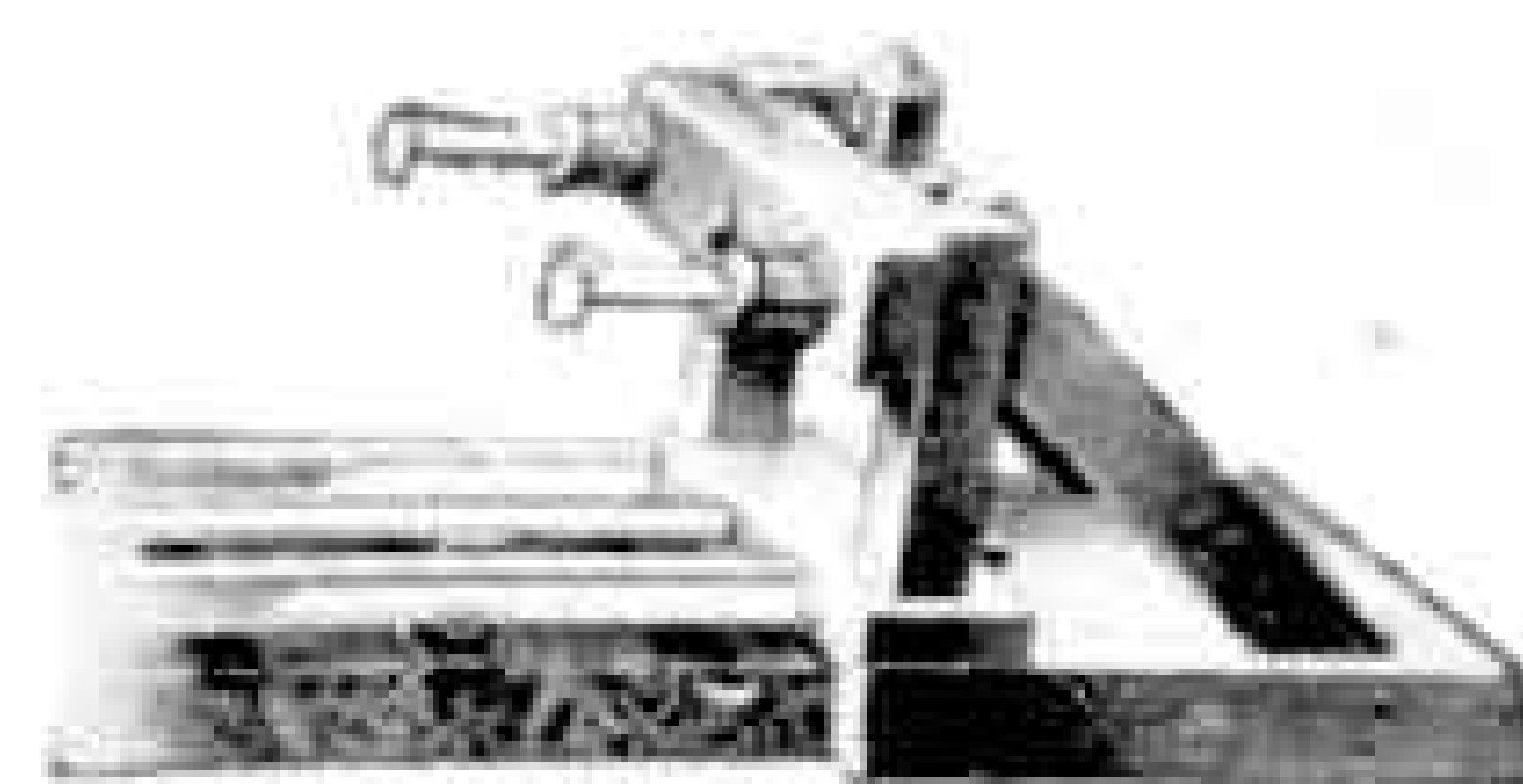
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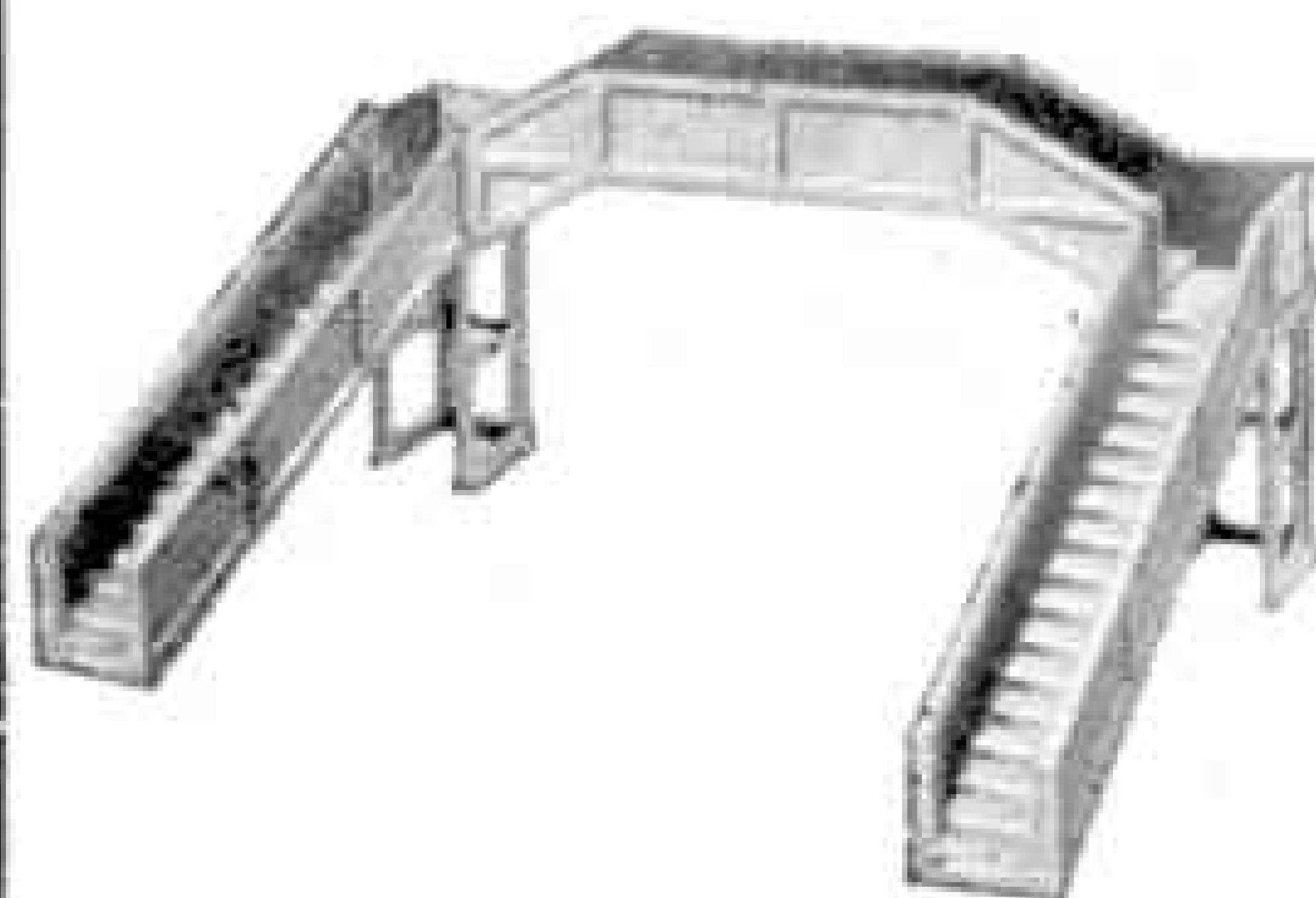
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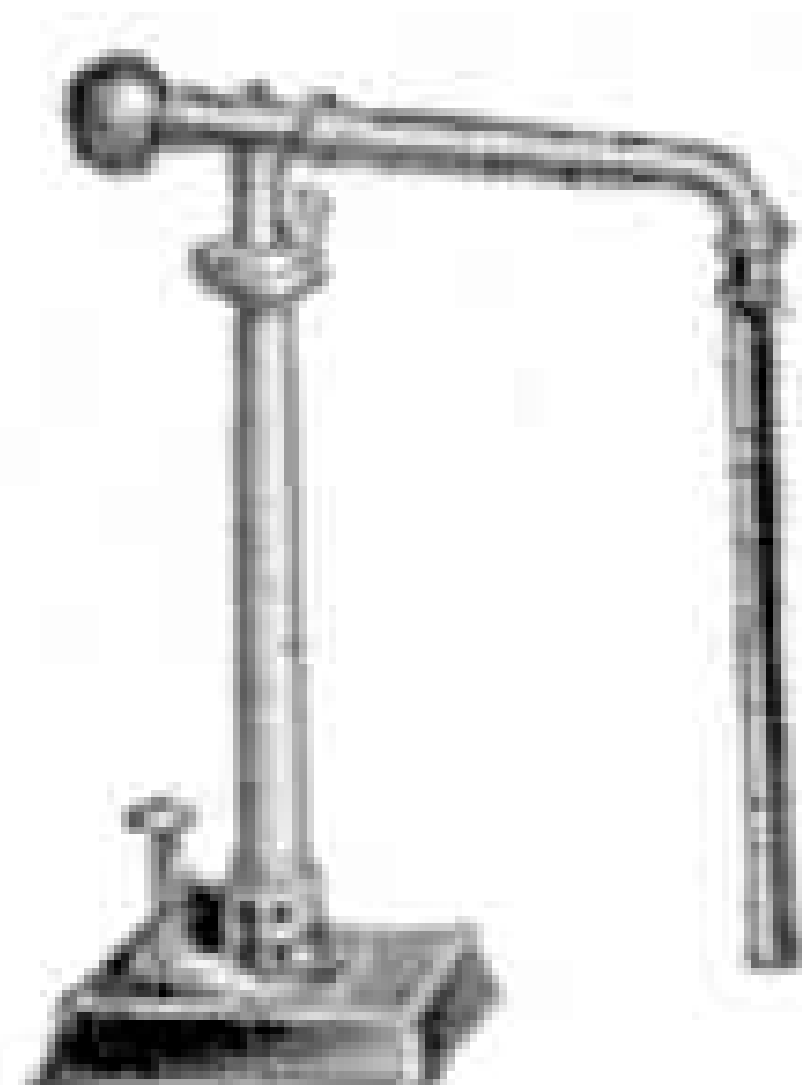
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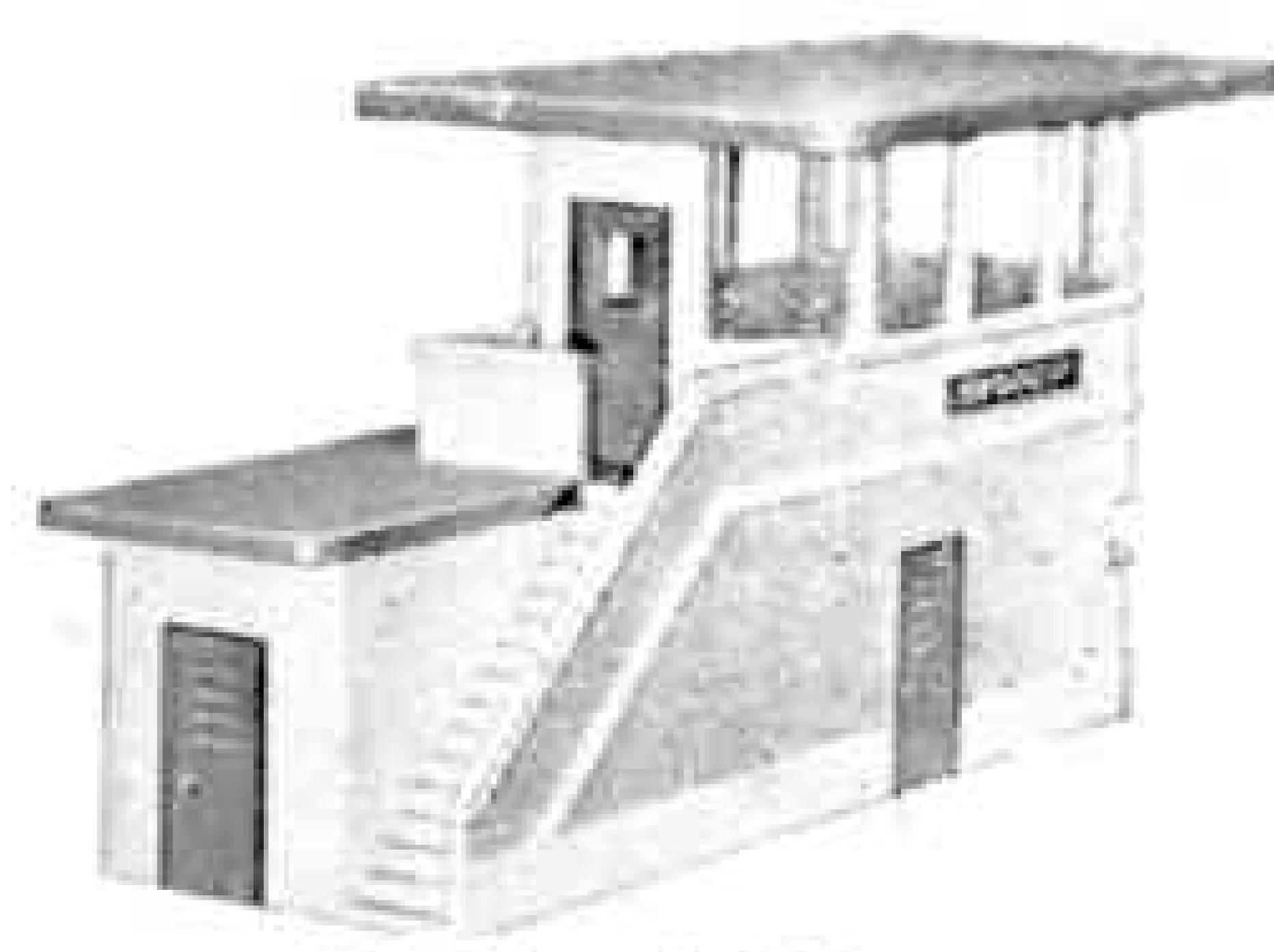
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